US NAVY NORTHERN DIVISION
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-94-D-0398
DELIVERY ORDER NO. 0013

~~DRAFT~~
WORK PLAN

TANK FARM NO. 4 REMEDIAL ACTIONS (CLEANING)
NAVAL EDUCATION AND TRAINING CENTER (NETC)
NEWPORT, RHODE ISLAND

~~April 1996~~
MAY 1996

+ H&S PLAN
+ SOW WTP OPS

Prepared by

Foster Wheeler Environmental Corporation
470 Atlantic Avenue
Boston, MA 02210

Revision	Date	Prepared By	Approved By	Pages Affected
2 3	4/26/96	M. Zizza, P.E.	J.E. Holwell, P.E.	i - iii; 7-1 - 7-6

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1.0 INTRODUCTION

1.1 Project Background

The Naval Education and Training Center (NETC) Tank Farm No. 4 is a 90-acre site located in the Town of Portsmouth, Rhode Island (Newport County) as shown in Figure 1-1. The tank farm contains 12 large underground storage tanks (USTs), which were used primarily to store No. 6 fuel oil. For a brief period, several USTs were used for storing No. 2 fuel oil. The storage tanks were in operation until the late 1970s. In 1992, the State of Rhode Island revised the Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Materials to include those USTs storing fuel oil. Consequently, the tanks at Tank Farm No. 4 became subject to relevant closure requirements. Following enactment of the new UST regulations the Navy initiated the process for permanent closure of the tanks.

On behalf of the Navy, Halliburton NUS Corporation (HNUS) completed a Preliminary Closure Assessment of Tank Farms Nos. 4 and 5 in June, 1995. Subsequently, OHM Remedial Services Corporation closed Tank Farm No. 5 completely and initiated closure of UST No. 42 in Tank Farm No. 4. Presently, Rhode Island Department of Environmental Management (RIDEM) has not approved closure of UST No. 42 since the associated pump room has not yet been closed. Brown and Root Environmental, a division of HNUS, conducted an assessment of the closure of UST No. 42 and submitted a final Tank 42 Closure Assessment Report dated December, 1995.

Under Remedial Action Contract N62472-94-D-0398 Delivery Order No. 0013, Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) was selected as the Contractor to complete the closure of UST No. 42 and the remaining 11 USTs in Tank Farm No. 4. Closure activities will include removal and disposal of UST contents, pump room cleaning and equipment removal, followed by UST cleaning and demolition. Activities will also include removal and disposal of associated "shunt and loop" piping and the removal of a concrete oil/water separator. Foster Wheeler Environmental is required to conduct such activities according to the above mentioned regulations. A final tank closure assessment report will be submitted to RIDEM for each UST when all activities have been completed.

1.2 Objectives

The objectives to be met for this Delivery Order are:

- Confirmatory sampling and analysis of tank contents;
- Removal and off-site disposal of approximately 1,000,000 gallons of fuel oil and free product fraction of tank contents;
- Treatment of approximately 15,400,000 gallons of water to achieve the local limits for accepted contaminant levels and discharge to the Newport Publicly Owned Treatment Works (POTW) via the NETC sanitary sewer;
- Removal and off-site disposal of approximately 220,000 gallons of sludge;
- Cleaning and inspection of tanks;
- Preparation of UST Closure Reports,
- Demolition of tanks following RIDEM acceptance;
- Removal and off-site disposal of loop and shunt piping;
- Removal and off-site disposal of asbestos insulation from steam lines;
- Off-site disposal of any petroleum-impacted soil excavated;
- Removal and off-site disposal of pump room piping and equipment; and
- Cleaning and demolition of pump rooms and tank chambers.

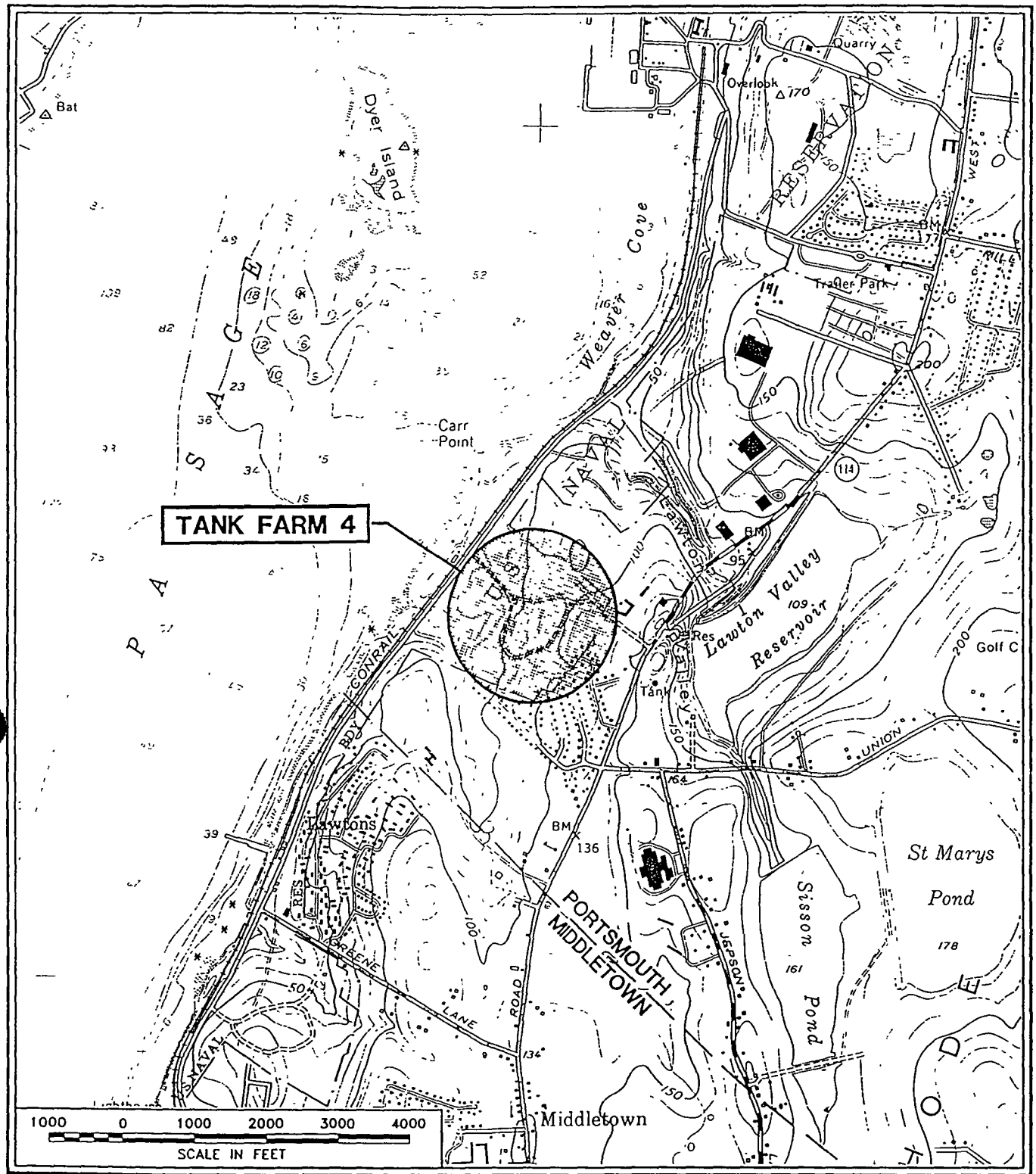


FIGURE 1-1

Naval Education and Training Center
Newport, Rhode Island

SITE LOCATION MAP

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE:1284FG11.DWG

1.3 Overview of Work Plan

This Work Plan presents the proposed implementation of the project. Section 1.0 provides an introduction. Section 2.0 outlines the site conditions and history, including the Environmental Conditions Report. Section 3.0 presents the project staffing and organization and summarizes planning activities and project documents to be prepared. Section 4.0 discusses the sequencing of activities for execution of the project. Section 5.0 summarizes elements of the Project Close-Out. Section 6.0 references the Project Plans which are attached as Appendices.

2.0 SITE DESCRIPTION

2.1 Site Location and Condition

NETC-Newport Tank Farm No. 4 is located in the Town of Portsmouth in Newport County, Rhode Island (refer to Figure 1-1). The 90 acre site is abutted to the north and east by Tank Farm No. 3 and Defense Highway, to the east and south by residences and Tank Farm No. 5 and to the west by Defense Highway. (refer to Figure 2-1). Tank Farm No. 4 slopes to the west/southwest between approximate elevations, 20 and 112 feet above sea level. Narragansett Bay ranges from between 500 and 1000 feet to the west. Norman's Brook is located in the southwest portion of the site and trends northwest, discharging into Narragansett Bay.

Tank Farm No. 4 contains 12 USTs, numbered 37 through 48. UST locations are illustrated in Figure 2-1. The tanks were used to store virgin heavy fuel oil (No. 6) from the 1940s to early 1970s. For a brief period in the mid-1970s, No. 2 fuel oil was repeatedly stored in several of the USTs. An oil-water separator associated with the USTs is located along the western portion of the site as depicted on Figure 2-1. A paved access road extends from Defense Highway onto the site. The access road splits and loops around the site providing access to the individual USTs. A perimeter fence surrounds the site, except along Defense Highway. The fence is approximately 7 feet high with 3 strands of barbwire along the top edge. The majority of the site is vegetated with tall grass, dense brush and small diameter trees. Outer perimeter portions of the site are more heavily wooded.

2.2 Site History

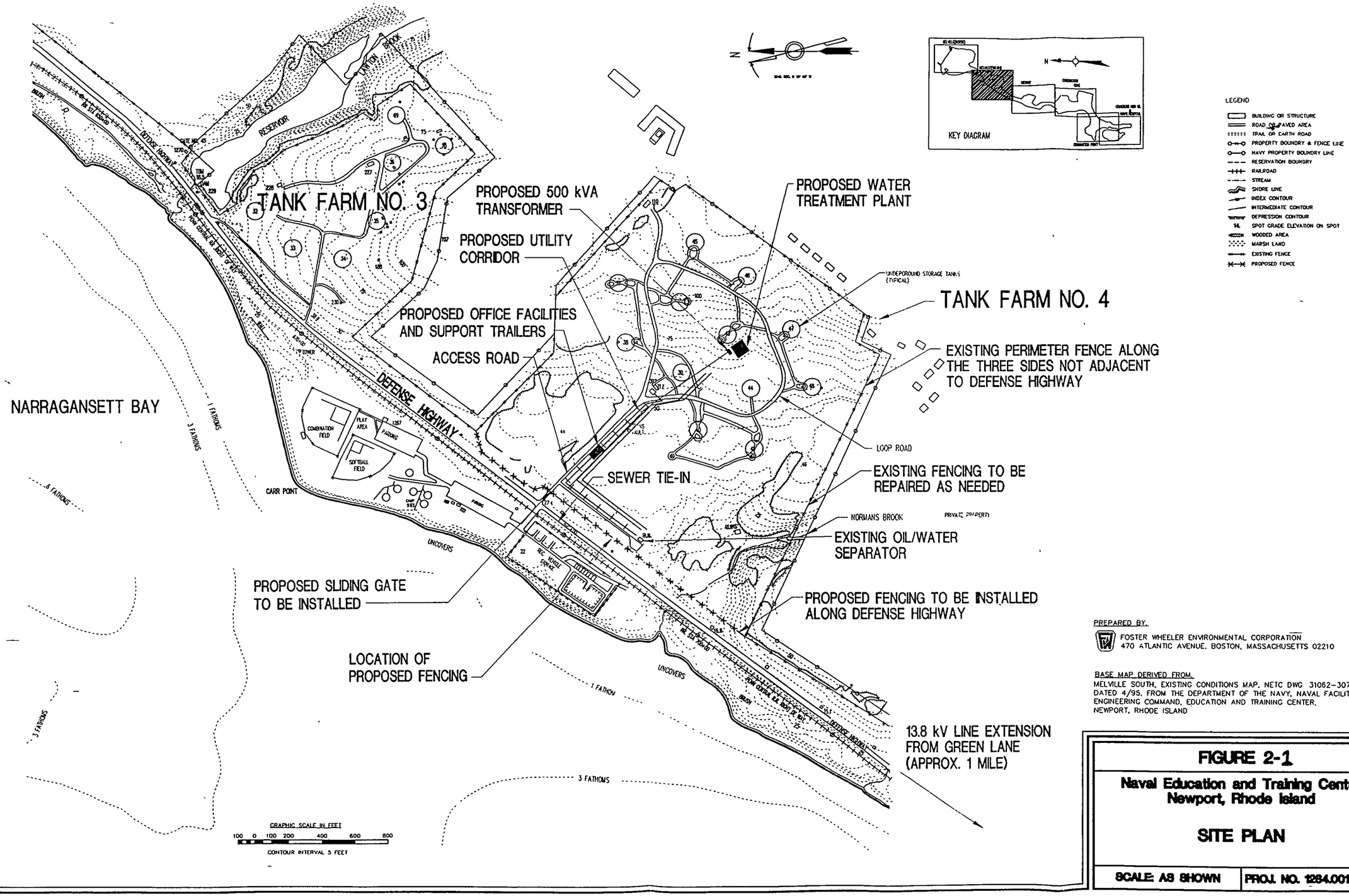
The U.S. Navy constructed five tank farms at NETC-Newport in 1941. The tank farms were used for the storage of oils and other petroleum products. Twelve USTs were constructed on-site as part of Tank Farm No. 4. Installation of the tanks required removal of the overburden soil and blasting between 10 to 30 feet of bedrock to create a "socket". The USTs were constructed within the sockets from poured pre-stressed reinforced concrete. The USTs are approximately 119 feet in diameter and approximately 36 feet in height. After construction, the crushed bedrock and other backfill was used to fill the annular space between the UST wall and existing bedrock The UST tops were covered with fill and topsoil.

A 12 inch diameter reinforced perforated concrete drain pipe was constructed around the base of each tank allowing removal of groundwater to prevent empty tanks from becoming buoyant. This system was termed "ring drain". A "shunt and loop" piping system was also installed. The shunt piping system connects each UST to its associated pump room. Each shunt piping system feeds into the loop piping system which fed petroleum to a trunk line servicing Naval piers to the south. Fuel was transferred to and from these USTs through this piping system. This piping system also included steam, condensate, water, and bottom sediment pipe lines.

Tank Farm No. 4 stored fuel oil from World War II until abandonment in the 1970s. For a brief period, from 1974 to 1978, three to four unidentified tanks were reportedly leased to Northeast Petroleum (Martin 1995) to store No. 2 heating oil. Upon lease termination, Northeast Petroleum reportedly cleaned the USTs. Tank Farm No. 4 has not been used since.

2.3 Environmental Conditions Report

A site visit was conducted on February 7, 1996 by Foster Wheeler Environmental personnel. Photographs were taken as part of the site visit in order to document the existing conditions. These documents will be presented as part of the Environmental Conditions Report.



PREPARED BY:
FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE, BOSTON, MASSACHUSETTS 02210

BASE MAP DERIVED FROM:
MELVILLE SOUTH, EXISTING CONDITIONS MAP, NETC DWG 31062-307 – DATED 4/95, FROM THE DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND, EDUCATION AND TRAINING CENTER, NEWPORT, RHODE ISLAND

FIGURE 2-1

Naval Education and Training Center Newport, Rhode Island

SITE PLAN

SCALE: AS SHOWN | PROJ. NO. 1284.0013.0103

1284FG12.DWG
4/16/96

3.0 PROJECT PLANNING AND ORGANIZATION

3.1 Project Staffing

Figure 3-1 depicts the Foster Wheeler Environmental project organization for this delivery order. The organization represents the direct line of authority during project execution. Figure 3-2 illustrates the overall program organizational chart, which depicts the communication paths between the Navy team and Foster Wheeler Environmental. The responsibilities for each position are discussed as follows:

3.1.1 Project Manager

Mr. John Holwell, P.E. is the Project Manager. He reports directly to Mr. Art Holcomb, P.E., the Program Manager. Mr. Holwell is the primary point of contact for this Delivery Order, and is responsible for project communications and management of project activities, planning and scheduling site activities and procurement of labor, materials and subcontracts. Mr. Holwell develops, tracks and manages the budget and schedule. He recommends and processes change orders, maintains technical quality and ensures safe work practices and regulatory compliance at the site.

3.1.2 Project Engineer

Mr. Michael Zizza, P.E. is the Project Engineer. He reports to Mr. Holwell and is responsible for coordinating all technical activities associated with pre-construction plans, permit applications and Work Package preparation. Mr. Zizza is the primary point of contact for technical issues required to support site activities.

3.1.3 Site Manager

Mr. Jon Cary is the Site Manager. Mr. Cary is responsible for managing and directing all on-site activities. These activities include supervision of subcontractors, and direct labor, site procurement of materials and subcontractors; interfacing with the Navy Resident Officer in Charge of Construction (ROICC) and ensuring compliance with contract documents. Mr. Cary is supported by one Site Superintendent (to be determined).

3.1.4 Site Superintendent

The Site Superintendent (to be determined) will support the Site Manager during major phases of the project by overseeing craft workers, equipment operators, and the various aspects of the tank farm closure and disposal of materials and wastes.

3.1.5 Site Engineer

Mr. Mark Gouveia is the Site Engineer. Mr. Gouveia will prepare Standard Operating Procedures for site activities, initiate and process Field Change Requests and Design Change Requests and maintain red-lined mark-ups of record drawings at the site.

3.1.6 Quality Control System Manager (QCSM)

Mr. Douglas Murphy is the Quality Control System Manager. Mr. Murphy will have overall responsibility for Quality Control at the site and shall be present at the site whenever work is in progress. The QCSM

shall have line responsibility to the QC Program Manager and a dotted line responsibility to the Site Manager for Quality Control.

3.1.7 Site Health and Safety Officer (SHSO)

Mr. Tom Hawthorne is the Site Health and Safety Officer. Mr. Hawthorne will be on-site full time during remediation and will have dotted line responsibility to the Site Manager. The SHSO will have direct line responsibility to the Program Health and Safety Manager. The SHSO will ensure that activities adhere to the letter and intent of the Site Health and Safety Plan (SHSP) and will monitor operations for routing and unanticipated exposures. The SHSO will be assisted by up to two (2) Safety and Health Technicians.

3.1.8 Cost/Scheduler Engineer

Mr. Eric Jones is the Cost/Scheduler Engineer. Mr. Jones will track site activity progress, track the project schedules, develop cost reports, produce weekly progress reports and provide management information to the Home Office Project Controls for monthly updates of the progress report and invoice.

3.2 Permitting

It is assumed that all environmental permits will be obtained by the Navy. Foster Wheeler Environmental will prepare the necessary documentation to support applications. The following permits are considered to be required:

- Newport POTW Discharge Permit - a single application to cover both sanitary and process water discharge. Ninety (90) days has been assumed for Newport approval.

- RIDEM Wetlands Permit - It is anticipated that work within wetlands and/or buffer zone will be performed as an Insignificant Alteration and include only work in the proximity of Defense Highway: 13.8 kV Line Extension, Sewer connection and fence erection. The necessary level of effort has also been included for a site walk-down by a staff scientist to ensure that no other wetlands will be impacted by the envisioned work. Forty-five (45) days have been assumed for RIDEM approval. Foster Wheeler Environmental assumes communications and submittal of information to The Navy for obtaining necessary 404 permits.

- Coastal Resources Management Council (CRMC) Consistency Determination - Will be submitted for information only and requires no approval. The required information will be based upon work already completed at Tank Farm #5.

At this time, Foster Wheeler Environmental assumes that air permitting will not be required. A review of the appropriate regulations and communications with RIDEM Air and Hazardous Materials Division is currently being performed in order to confirm this assumption.

3.3 Work Package Preparation

Major site activities have been grouped into Work Packages, and sequenced for implementation. The Work Package concept will be used to ensure that the appropriate materials and equipment have been procured, regulatory requirements met, site preparatory activities completed, and appropriate staffing available to complete the construction activities.

Due to schedule requirements, Foster Wheeler Environmental intends to develop Work Packages in conjunction with each discrete phase of construction/remediation activity. These phases are envisioned to be the following:

1. Mobilization and Site Preparation
2. Support and Waste Handling Facilities
3. Tank Closure
4. Shunt and Loop Piping Removal
5. Waste Stream Handling
6. Demobilization and Site Restoration

The Work Packages, which will be prepared concurrently with project implementation of earlier phases, will contain the detail necessary to plan and execute. These details are normally included in Design plans and specifications as well as contractor submittals. Since Foster Wheeler Environmental is providing an integrated design/build effort, details normally included in specifications required solely for outlining contractor submittal requirements will not be included for efforts which are being self-performed. Work Package Preparation includes the planning and preparation for work activities. Specifically, the work will be sequenced, equipment and personnel requirements will be determined, and guidelines for the execution of work will be developed. Additional information required to complete the package will be identified. The Work Packages and major components of each are listed as follows:

Work Package 1 - Mobilization and Site Preparation:

- Initiate Site Health and Safety Program
- Wetland Delineation
- Clearing and Mowing
- Erosion and Sediment Control
- Fence Repair and Installation
- Utility Service Installation
- Temporary Facilities Preparation
- Site Road Repair/Improvement
- Permit Applications

Work Package 2 - Support and Waste Handling Facilities:

- Decontamination, Office, Storage Trailers Installation
- Equipment Decontamination Facilities
- Utility Connection to Trailers
- Equipment and Materials Procurement

Work Package 3 - Tank Closure:

- Operation of Ring Drain System
- Open Tanks
- Contaminated Water Transfer to "Holding" Tank
- Vapor Freeing and Air Monitoring
- Product and Product Residuals Removal
- Tank Cleaning
- Pump Room Cleaning and Equipment Removal

- Documentation of Cleaning
- Tank Closure

Work Package 4 - Shunt and Loop Piping Removal:

- Pipe Draining and Cleaning
- Piping Excavation and Removal
- Asbestos Abatement Services
- Oil/Water Separator Demolition
- CT Chambers Demolition

Work Package 5 - Waste Stream Handling:

- Soil Handling and Storage
- Water Treatment Plant Equipment
- Water Treatment Plant Temporary Structure Erection
- Tank Product Disposal
- Pump Room Equipment
- Tank Product Residuals Disposal
- Piping Disposal/Recycling
- Asbestos Disposal
- Water Treatment Facility Waste Disposal

Work Package 6 - Demobilization and Site Restoration:

- Demobilize Water Treatment Plant and Temporary Structure
- Demobilize Support Facilities
- Site Restoration and Revegetation

Close-Out:

- Tank Structural Integrity Inspections
- Tank Closure Inspections
- Tank Closure Reports
- Post Project Plans

These Work Packages will contain several components tailored to provide the necessary information to support procurement activities as well as to ensure that activities are in compliance with this Work Plan and other Planning Documents. These components include the following:

Site Logistics Work Packages (SLWPs)

Where new temporary facilities need to be constructed, a Site Logistic Work Package will be prepared to provide the necessary information for the construction and operation of the facility/structure. This package may include drawings, standard construction details, equipment specifications, material specifications and/or standards or guidelines to be followed for the construction of the facilities. Based on information gained from Tank Farm 5 documents, it is anticipated that SLWPs will be prepared for an estimated five (5) specific efforts. SLWPs identified, along with the associated Work Package, are as follows:

- Site Layout (WP#2)
- On-site Temporary Utilities (WP#2)
- Equipment Decontamination Facilities (WP#2)
- Tank Cleaning Systems Facilities (WP#3)
- Water Treatment Facilities (WP# 5)

Standard Operating Procedures (SOPs)

SOPs will be developed which detail the methods for performing various construction/remediation tasks. For work which is to be self-performed, these SOPs will be developed based on the need to provide the greatest amount of construction production while maintaining compliance with the SHSP and other planning submittals to be prepared. For specialty tasks which will be performed, or supported, by Subcontractors, these SOPs will be integrated with the appropriate Statement of Work (SOW), to be used initially for procurement purposes and subsequently for field work. Based on information gained from tank Farm 5 documents, it is anticipated that SOPs will be prepared for an estimated twelve (12) specific efforts.

SOPs identified, along with the associated Work Package are as follows:

- Ring Drain System (WP# 3)
- Water Removal (WP# 3)
- Product Removal (WP# 3)
- Product Residual Removal (WP# 3)
- Tank Cleaning (WP# 3)
- Pipe Draining and Free Liquid Removal (WP# 4)
- Piping Excavation & Removal (WP# 4)
- Pump Room and CT Chambers Demolition (WP# 4)
- Soil Handling & Storage (WP# 5)
- Water Treatment (WP# 5)
- Steel Processing and Handling (WP# 5)

Statements of Work (SOWs)

To support the Procurement effort, SOWs will be prepared for subcontracted services or major items necessitating performance requirements. Based on information gained from Tank Farm 5 documents, it is anticipated that SOWs will be prepared for an estimated fourteen (14) specific efforts.

SOWs identified, along with the associated Work Package are as follows:

- Fencing Repairs/Modifications (WP# 1)
- 13.8 kV Line Extension (WP# 1)
- Lift Station/Sanitary Sewer Tie-In (WP# 1)
- Surveying Services (WP# 1)
- Site Clearing and Mowing (WP# 1)
- On-Site Electrical Services (WP# 2)
- Laboratory Analysis - Solid & Liquid (WP# 3)
- Laboratory Analysis - Air (WP# 3)
- *Asbestos Abatement Services (WP# 4)
- Temporary Structure (WP# 5)

- *Water Treatment Equipment (WP# 5)
- Waste Disposal (WP# 5)
- Metals Recycling (WP# 5)
- Paving Services (WP# 6)

*= SOWs envisioned to include attached CSI format Specification

It is assumed that review by NETC Engineering will be required for Subcontractor Submittals relevant to permanent equipment installed under this Delivery Order (i.e., 13.8 kV Extension, Sewer tie-in, and fencing). It is assumed that other Subcontractor submittals will not require Navy review.

3.4 Subcontracting and Procurement

The acquisition of materials and services to support this Delivery Order will be in conformance with the Federal Acquisition Regulations (FARs). The work within each work package has been further divided into procurement packages which are identified in Table 3-1. These material and subcontract procurements will be initiated in the home office to support initial site activities, and will be managed from the field for the remainder of the project activities.

Engineering Staff will prepare Statements of Work for subcontract services. As appropriate, specifications and drawings will accompany the SOWs. SOWs will identify the scope of services required, schedule constraints, interfacing requirements, and submittal requirements, in addition to providing site background summary, and health and safety requirements for site work. Procurement personnel will provide the contractual and administrative portions of the package.

Procurement of materials and equipment will be performed using purchase requisitions, to which appropriate specifications and/or drawings will be attached.

In addition to the material and service procurements, local vendors will be identified and accounts established to supply commodity items such as office supplies, lumber, rental tools and building supplies.

TABLE 3-1
PROCUREMENT

Work Package 1 - Mobilization and Site Preparation		
PROCUREMENT PACKAGE	**SCOPE**	**CONTRACT TYPE**
Fencing	Fence Repairs/Modifications	FUR SOW
Electrical Subcontractor	13.8 kV Line Extension	FP SOW/SPEC
Plumbing Subcontractor	Lift Station/Sanitary Services Tie-In	FP SOW/SPEC
Policing	Local Police Detail	FUR
Telephone Service	Temporary Telephone Connections	FUR
Surveyor	Site Surveying Services	FUR SOW
Office Facilities	Site Trailers	FUR
Portable Toilets	Craft Toilets	FUR
ADP-Computers	Computers	FUR
ADP-Radios	Site Radios	FUR
ADP-Office Equipment	Copiers and Faxes	FUR
Telephone Equipment	Telephone Equipment	FP
Health & Safety Supplies	Health and Safety Expendable	FUR ID/IQ
Health & Safety Equipment	Health and Safety Equipment	FUR BPO
Office Supplies	Stationary/toiletries	ID/IQ
Off-Site Disposal	Off-site Disposal Trans./facilities	FUR
General Trash Disposal	Off-site Trash Disposal	FUR
Furniture	Office Furniture	FUR
Site Clearing	Mowing and Clearing	FUR SOW
Heavy Equipment	Excavation Equipment	FUR
Site Vehicles	Site Vehicles	FUR
Signage	Site Signage	FP
Geotextile	Geotextile	FUR
Bulk Site Equipment	Sand, Gravel, Stone, etc.	FUR
Erosion Control	Haybales & Silt Fencing	FUR
Spill Control	Spill Control Equipment	FUR
Fuel Supplier	Fuel	FUR BPO

Work Package 2 - Support and Waste Handling Facilities		
PROCUREMENT PACKAGE	**SCOPE**	**CONTRACT TYPE**
Personnel Decon	Decontamination Trailers	FUR
Sampling Equipment	Sampling Equipment & Supplies	FUR
Decon Equipment	Vehicle & Steel Decon Equipment	FUR
Decon Supplies	Decon Supplies	FUR BPO
Air Monitoring Equipment	Air Monitoring Equipment	FUR BPO
Electrical Subcontractor	On-Site Electrical Services	T&M SOW
Building Materials/Supplies	Construction Material	FUR BPO

TABLE 3-1 (cont'd)

Work Package 3 - Tank Closure		
PROCUREMENT PACKAGE	**SCOPE**	**CONTRACT TYPE**
Structural Fill	Backfill Material	ID/IQ
Laboratory Analysis	Laboratory Analysis: Solid and Liquid	FUR SOW
Laboratory Analysis	Laboratory Analysis: Air	FUR SOW
Air Blowers	Temporary Ventilation Equipment	FUR
Centrifugal Pumps	Ring Drain Pumps	FP SPEC
Submersible Pumps	Tank Contents Removal Pumps (water)	FP SPEC
Product Recovery Pumps	Tank Contents Removal Pumps (oil)	FP SPEC
Steam Cleaning Equipment	Tank Cleaning	FUR SOW
Lighting	Temporary Lighting	FUR SOW
Electrical Materials	Intrinsically Safe Electrical Components	FP
Asbestos Abatement Subcontractor	Asbestos Abatement Services	FUR SOW/SPEC

Work Package 4 - Shunt & Loop Piping Removal

Work Package 5- Waste Stream Handling		
PROCUREMENT PACKAGE	**SCOPE**	**CONTRACT TYPE**
Waste Disposal	Waste Disposal	FUR SOW
Metal Recycling	Metal Recycling	FUR SOW
Temporary Structure	Water Treatment Structure	FUR SOW
Water Treatment	Water Treatment Equipment	FUR SOW/SPEC
Temp Storage	Frac-Tanks	FUR

Work Package 6- Demobilization & Site Restoration		
PROCUREMENT PACKAGE	**SCOPE**	**CONTRACT TYPE**
Paving Subcontractor	Paving	FUR SOW

Abbreviations:

BPO	Blanket Purchase Order
FUR	Fixed Unit Rate
T&M	Time and Materials
FP	Fixed Price
ID/IQ	Indefinite Delivery/Indefinite Quantity

Figure 3-1
Foster Wheeler Environmental Project Organizational Chart

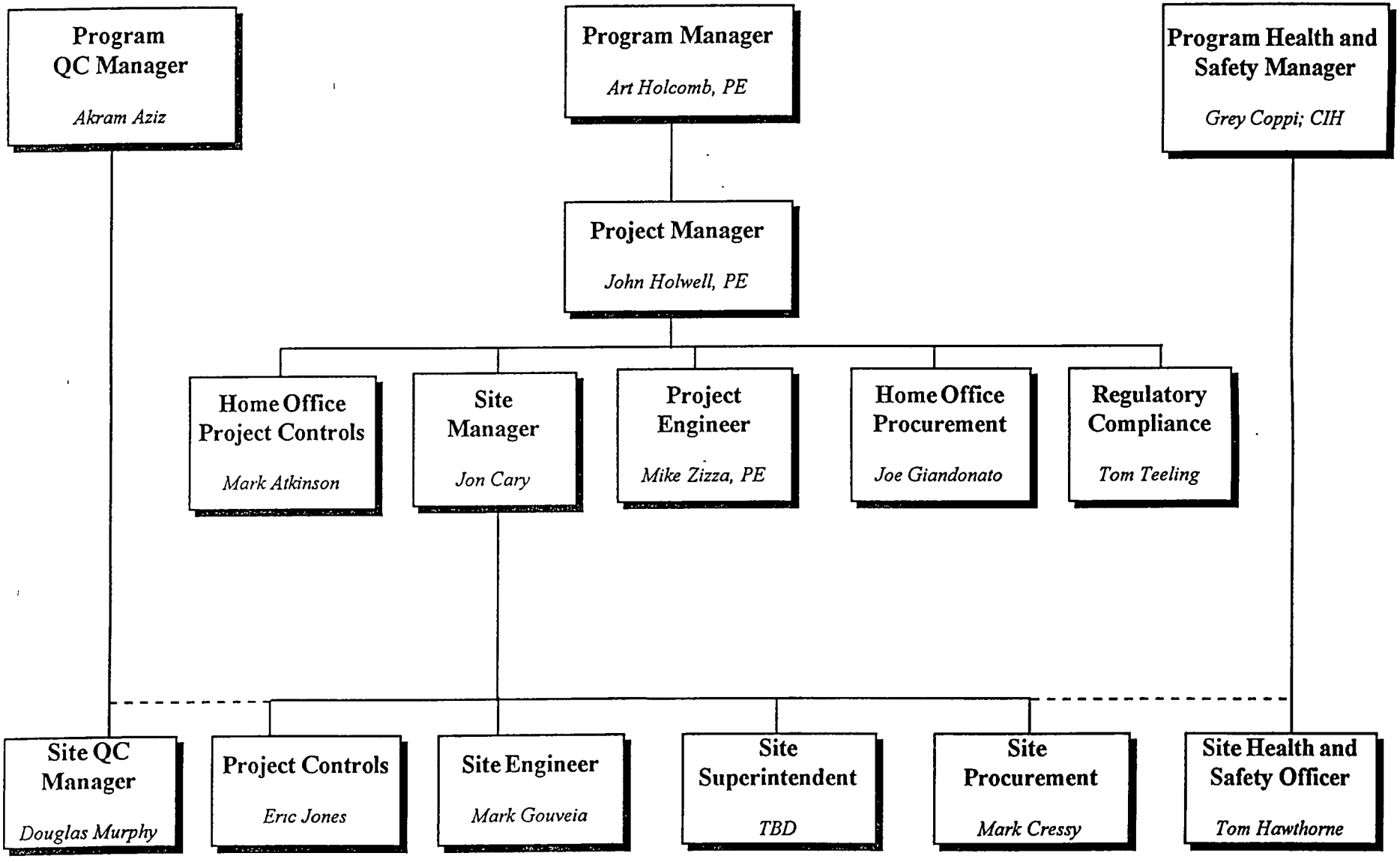


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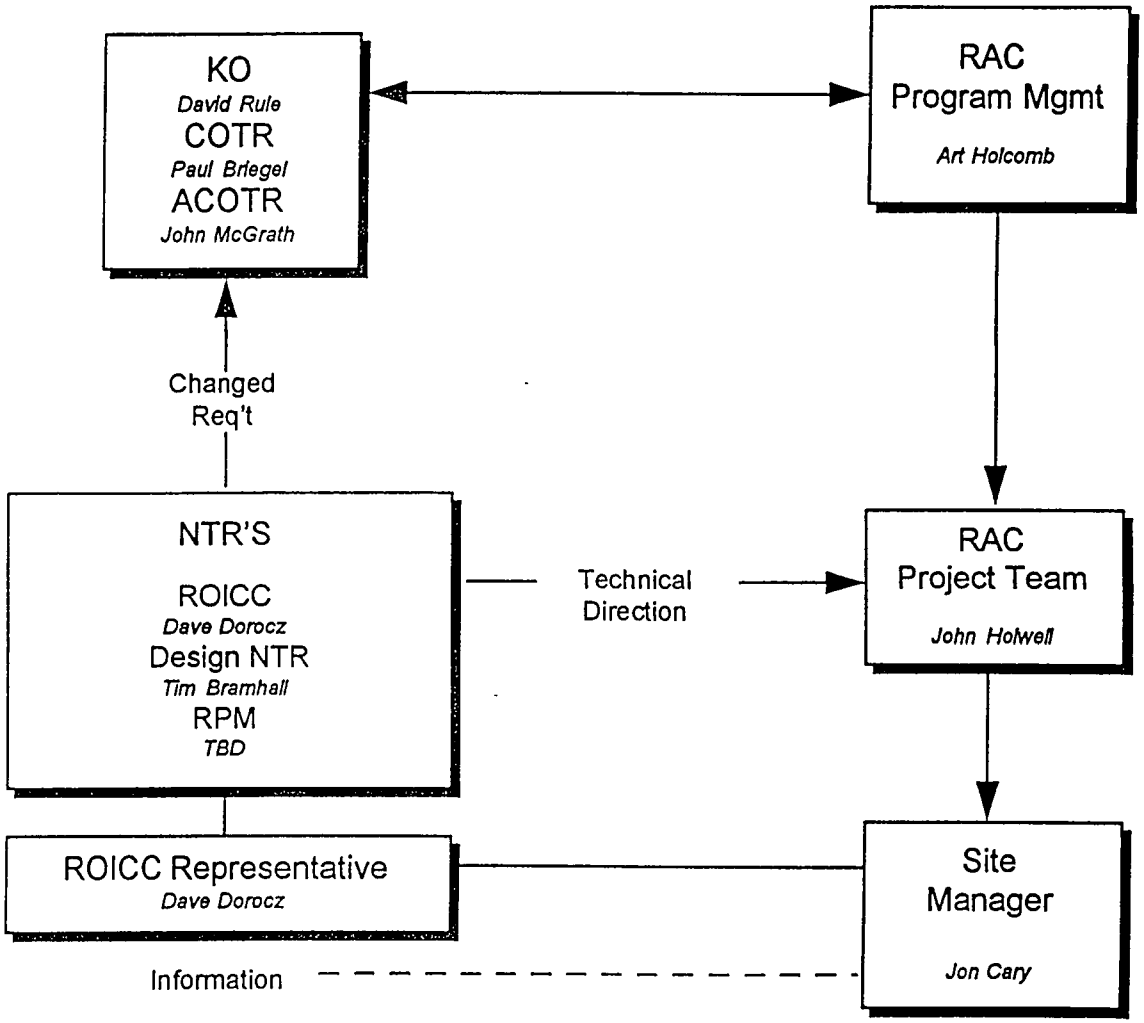
Figure 3-2
Overall Program Organization



Notes:

1. Changed requirements are forwarded from the design NTR to the COTR in writing for Contracting Officer approval.
2. Technical direction shall be from the ROICC NTR after coordination with the Design and RPM NTR. Construction related issues are coordinated by the ROICC NTR, design issues by the design NTR and regulatory issues by the RPM NTR.
3. Information will be exchanged between the Project Superintendent and the Title 2 Services Contractor to expedite the review process, as needed. Direction will be taken only from the ROICC.

4.0 PROJECT EXECUTION

4.1 Mobilization and Site Preparation

The mobilization and site preparation phase of the project will encompass the initial activities which are required to establish a functional work site. The activities discussed below are presented in the general order in which they are planned to be accomplished. This section of the work plan provides only a brief description of the required elements for mobilization and site preparation. Necessary details will be presented as part of Work Packages 1 and 2. Refer to Figure 2-1 for approximate locations of proposed utility and facility locations.

4.1.1 Initiate Site Health and Safety Program

The SHSO will initiate the Site Health and Safety Program prior to any site activities. Initial health and safety activities will include personnel site specific training and obtaining background air quality readings for the parameters discussed in the SHSP. Additional details will be provided in the SHSP.

4.1.2 Wetland Delineation

A wetland delineation will be performed by a Foster Wheeler Environmental scientist. Identified wetlands will then be surveyed by a surveying firm licensed by the state of Rhode Island. The surveyed wetlands will be mapped as appropriate to satisfy RIDEM and CRMC application and permitting processes. Additionally, a site walkdown will take place during this delineation effort to ensure that no other wetlands will be impacted by the envisioned work.

The results of the wetland delineation will be used to base decisions regarding fence installation, utility poles installation, connections within the Defense Highway and implementation of erosion and sediment control measures. Wetland boundaries will be staked in the field at the time of the delineation to aid in identification and to allow RIDEM verification. It is anticipated that work within the wetland boundary or in the buffer zone will be considered an Insignificant Alteration.

4.1.3 Site Clearing and Mowing

Clearing operations will commence along the existing fence as necessary for fence inspections and repairs. Clearing will also be performed adjacent to Defense Highway as necessary for fence and access gate installation along the western perimeter of the site. Mowing will be accomplished at each UST work area, the support zone and the area of the water treatment plant. Mowing may be performed at locations along the on-site roadways to provide turn-arounds and pull-offs. The majority of the mowing will be accomplished using a Hydro-Axe which will chip/shred vegetation smaller than approximately 4 inches in diameter. Hand clearing with a chain saw/weed wacker will be required in areas not accessible to the large equipment. Small stumps/roots will be cut flush with the ground surface. Grubbing with a backhoe will be accomplished only as necessary for closure activities.

4.1.4 Erosion and Sediment Control

Erosion and sediment controls will be installed at existing site drainage features prior to clearing and mowing, and as soon as possible after mowing operations in other areas. Control measures will consist of limited clearing and mowing, and installation of silt fence/barriers. Mowed materials and cleared brush will be used to provide surface protection along heavily sloped areas. Storm water controls will consist of hay bale/silt fence filtration of surface run-off through culverts. The Site Clearing Plan (to be included in Work Package #1) will identify typical details and the generalized location of erosion controls. Actual locations of control measures will be based upon field conditions. Erosion controls will be inspected regularly and maintained as required. Further details and

explanations of the erosion and sediment control procedures are to be outlined in the Environmental Protection Plan.

4.1.5 Fence Repair and Installation

Foster Wheeler Environmental will inspect the existing fence to identify areas which need repair or could be easily compromised. Subsequently, a fencing contractor will repair the existing fence at marked locations. The fencing contractor will also install a perimeter fence and access gate across the western portion of the site adjacent to Defense Highway. Fencing materials will be of similar design to those currently in place at the site.

4.1.6 Security

Site security will be provided via the fencing upgrade, additional fencing in critical work areas and utilization of NETC security personnel to perform periodic drive-throughs of the site.

4.1.7 Utility Service Installation

Water service will be brought to the site from an existing hydrant located along the east side of Defense Highway. Proper precautions regarding cross connection will be implemented at the transition fitting on the hydrant. Metering will be provided to track water usage. The site water line will be laid over ground along a utility corridor adjacent to Defense Highway and the site access road. Refer to Figure 2-1 for the approximate location.

Sewer service will involve the construction of a lift station to boost the pressure of the effluent from the site to that of the force main which parallels Defense Highway. The lift station and tie-in to the existing line will be designed by a Civil/Sanitary Engineer registered in the state of Rhode Island. After crossing under Defense Highway and passing through the lift station the sewer line will be laid over ground adjacent to the access road within the utility corridor.

Electrical service will involve constructing a pole line to extend the 13.8 kV power from Green Lane along the east side of Defense Highway and within the utility corridor. The above ground line will terminate at a 500 kVA transformer located in the proximity of the Water Treatment Facility. Secondary electrical power will then be fed to a distribution panel located at the transformer via direct burial cable at a depth of approximately two feet. Power requirements during UST closure operations will be satisfied via electrical lines extending along the ground surface from the distribution panel. The support zone will be supplied with secondary electrical service via a pole-mounted 75 kVA transformer located in the proximity of the support zone trailers.

Telephone service will be connected to the poles along Defense Highway and brought to the support zone (two phonelines, a fax line and a modem line) and Water Treatment Facility (one additional phone line).

In general, utility services will be installed on the ground surface. At site road crossings water and sewer lines will be sleeved through reinforced concrete pipe or heavy weight ductile iron pipe buried approximately two-feet below grade. At site road crossings electrical distribution and telephone lines will be sleeved in separate rigid conduits buried approximately two-feet below grade.

Further details regarding site utilities will be presented in Work Packages 1 and 2.

4.1.8 Temporary Facilities Preparation

Grading and subgrade preparation will be required for the installation of the support zone trailers and the water treatment facility. Asphalt paving or a geomembrane lined crushed stone bed will be installed at the water treatment facility location. Appropriate perimeter berms will be installed as secondary containment as required. These facilities will be shown on the Site Preparation Plan drawing.

4.1.9 Site Road Repair/Improvement

Existing paved roads throughout the site will be repaired as required to support the expected loads/traffic generated by the project. Where repair will not suffice, repaving operations may be undertaken. The loop road will be designated as a one way traffic route. The access road, however, will have to be two way. Turnoffs will be constructed on the incoming side of the access road to ensure ample space for two way traffic. Stabilized access ways and lay down areas comprised of crushed stone will be installed at each tank/work area. Geotextile materials will be placed beneath crushed stone for reinforcement if required.

4.1.10 Equipment Decontamination Facilities

A temporary decontamination facility will be installed at a central location at the site to provide necessary equipment decontamination. Foster Wheeler Environmental envisions that only equipment used as a part of water treatment or UST closure operations will require decontamination prior to leaving the site. Foster Wheeler Environmental does not envision a need to decontaminate vehicles departing the site on a routine basis.

4.2 Support and Waste Handling Facilities

This section briefly describes the activities required subsequent to site mobilization and site preparation and prior to conducting UST closure activities. Work Package No. 2 will document the necessary details fully describing the activities of this section.

4.2.1 Facilities

The support zone will consist of site offices and storage trailers located in the vicinity of the entrance road. The waste water treatment facility will be established in the area south of UST No. 43, as shown on Figure 2-1. A temporary emergency personnel decontamination facility will be established at each UST in which closure activities are being performed. The main personnel decontamination facility will be staged in the area near the wastewater treatment facility.

4.2.2 Utility Connection to Trailers

Water and sewer lines will be installed from the main lines to the support zone water treatment facility and personnel decontamination facilities. A licensed electrician will provide above ground electric hook-ups from the distribution panel and utility pole mounted transformer to the support zone, water treatment facility and each UST location. Temporary telephone lines will be connected from the main telephone line to the office and support trailers. Several telephone lines will be connected to the office trailer including a fax line and a modem line.

4.2.3 Storage Area

Several roll-off containers will be placed near the water treatment facility to stockpile construction demolition debris. Roll-off containers will be dedicated to separate construction wastestreams which include: shunt and loop piping, asbestos covered piping, Personal Protective Equipment (PPE) and other contaminated material and miscellaneous non-hazardous construction debris. Roll-off containers will be covered with tarps during non-working hours.

4.2.4 Non-Hazardous Waste Disposal

Non-hazardous construction debris will be disposed at a landfill off-site which accepts construction debris. Waste transportation and disposal services will be contracted to provide roll-off containers and off-site transportation and disposal services.

4.3 Tank Closure

Eleven UST's require removal of liquid contents, cleaning and closure. The Navy has identified three distinct layers of liquid in the USTs. The surface layer is a weathered, free floating product (either Fuel Oil No.6 and/or No. 2) which is underlain by a layer of standing water and a settled sludge/sediment which rests on the bottom of the tank. The volumes of each layer vary between the USTs and were identified in the initial scope of work. Prior to removal of tank contents, Foster Wheeler Environmental will gauge and verify tank contents and quantities to confirm disposal requirements. The activities comprising UST closure operations are described briefly below. Work Package No. 3 - Tank Closure will provide the details fully describing the closure operations.

The suspected leaking tanks (38,42,45 and 48) are scheduled to be the first cleaned. UST No. 43 will be used as a holding tank for water collected during closure operations. As water treatment flow rates permit, the water will be pumped from the holding tank to the water treatment facility. Upon completing the closure of the other USTs, the holding tank will require a final cleaning prior to its closure.

4.3.1 Operation of Ring Drain System

A ring drain system is installed around the outside perimeter of each UST. The ring drain system allows for local control of the groundwater table to prevent the UST from becoming buoyant. Prior to emptying each UST, Foster Wheeler Environmental will reinitiate the operation of the ring drain system. Once functional, the ring drain system will be operated when the UST contents are drawn down eight (8) or more feet below the groundwater table. The system will be continuously operated until the UST is demolished. The groundwater extracted from the ring drain system will be transferred to the water treatment holding tank and processed through the water treatment facility.

4.3.2 Open Tank Top

To provide safe and effective access for equipment and personnel, Foster Wheeler Environmental will cut two openings on the top of each UST. The size of the holes will range from approximately 8 by 10 to 16 by 20 feet. The soil covering this area will be removed and used to form a berm around the openings in order to minimize storm water run-on. Upon completion of excavation, cut lines will be marked on the tank. Lifting anchors will be installed on the concrete portions to be removed. The concrete will be cut using a walk behind concrete cutter. Utilizing lifting cables attached to the lift anchors, a crane will be used to support the cut concrete section during removal. The area will be fenced off and temporary wooden covers will be placed over the openings until UST cleaning operations commence.

4.3.3 Contaminated Water Removal

As the water in each UST is removed it will be transferred to the holding tank. Water removal will be accomplished with a four-inch hydraulic pump which will be lowered into the UST with a gantry hoist and a chainfall.

4.3.4 Vapor Freeing and Air Monitoring

Upon completion of water removal, the UST and pump chambers will be purged of Hazardous vapors. An explosion proof blower rated for 60,000 CFM will be positioned over the UST's existing manholes. A coppus blower (induction type) will be positioned to ventilate the pump chambers during demolition and cleaning activities. The blowers will operate continuously during daily working hours.

Air monitoring will be conducted inside the UST and chambers to ensure safe levels of hydrocarbon vapors, oxygen, carbon monoxide, and combustible gases prior to entrance of personnel into the tank and chambers. The SHSO will perform on-site air monitoring. Air monitoring will be conducted regularly as described in the SHSP. UST and chamber entries will be assessed, categorized, and posted according to OSHA confined space entry requirements. An emergency plan will be developed as part of the SHSP which addresses medical and fire aid as well as other environmental concerns.

4.3.5 Product and Sludge Removal

Scaffolding will be installed in one of the access holes. A bobcat dozer will be employed within the UST to assist in mixing and maneuvering the product and sludge to the sump for transfer. Diesel fuel will be added as necessary to the product and sludge within the UST to help reduce the viscosity. Subsequently, a four inch pump will be placed in the existing UST sump to transfer the product and sludge to temporary above ground storage tanks (ASTs). The temporary ASTs will provide an additional opportunity to remove entrained water from the product and sludge. ASTs used for holding sludge and/or oil will incorporate applicable requirements as appropriate (Refer to Appendix C - Waste Management Plan for regulatory information). The sludge will not remain on-site for longer than ninety (90) days. Wastes will be shipped off-site as soon as practical after removal from USTs.

4.3.6 Tank Cleaning

Once the product and sludge material is removed, the interior of the UST will be cleaned.

All electrical equipment used inside of tanks will meet Class I, Division 1 Gr. "D" requirements.

Two 45 foot manlifts will be lowered into the tank by a crane. The interior surfaces will be soaked with a cleaning solution. Thermal 3000 psi pressure washers will be used to apply the cleaning solution. The solution will be permitted to soak for approximately 24 hours. Subsequently the UST will be cleaned from top to bottom (ceiling, columns, walls and floors) using thermal 3000 psi pressure washers. The cleaning process will stop 4 feet above the floor surface. During cleaning operations a sump pump will be placed in the sump pit to transfer wash water to the treatment system holding tank.

Interior pipes will be cleaned by the pressure washers and through-drilled 2-inch holes every 10 feet. Once cleaned and vapor free, the pipe will be torch cut into workable lengths for crane removal from the UST.

Once the interior piping is removed, the lower 4 feet of the UST will be cleaned and then the floor will be cleaned. The floor cleaning will work towards the sump. The sump will be emptied and cleaned as the final cleaning step.

4.3.7 RIDEM Closure Inspection

Foster Wheeler Environmental will coordinate RIDEM inspection for cleanliness. During this walkdown of the tank interior, a punchlist will be developed and subsequently worked off. It is assumed that tanks will be considered clean when accepted by RIDEM.

4.3.8 Documentation of Cleaning

Each tank will be photographed and videotaped after completion of the cleaning operation including fulfillment of RIDEM punchlist items. The photographs and video will document the sides, bottom and top of the UST to record cleaning. A minimum of fifty (50) photographs per UST will be obtained. Foster Wheeler Environmental will prepare two sets of photograph albums (mounted and labeled and bound into booklets). Foster Wheeler Environmental will also provide the Navy with the negatives for each photograph and two labeled video cassette copies for each UST.

4.3.9 Tank Demolition

Once documentation of closure is complete and RIDEM has conducted a closure inspection, the UST will be demolished. A work plan addendum will be provided, following agreement with the Navy on method of demolition, that will detail tank demolition procedures.

4.4 Pump Chamber Closure

Each UST has an associated Pump Chamber that will also require activities to allow RIDEM UST closure. These activities include draining, equipment removal and cleaning, as necessary, prior to the closure of the pump chambers.

4.4.1 Pump Chamber Draining and Lid Removal

The pump chambers adjacent to each UST will be pumped with a submersible pump. The pumped water will be transferred to the holding tank for later treatment. Encountered oil or sludges will be pumped to a temporary AST for disposal off-site. After pumping operations, the pump chamber lids will be removed by crane.

4.4.2 Pump Room Piping and Equipment Removal

The fuel line and bottom sediment and water lines (BSW) will be cleaned using a water blaster and pipe cleaning attachment. Cleaning water will be transferred to the holding tank for treatment.

It is assumed that the Pump Room Chambers contain no asbestos and will not require Asbestos Abatement based on Tank Farm 5 conditions.

Pump chamber equipment removal will proceed from top to bottom. The pipes will be removed in manageable lengths by a crane and temporarily stockpiled. The Contracting Officer will determine whether the equipment will be disposed of, recycled or salvaged. Refer to Appendix C - Waste Management Plan for additional information concerning final disposition of materials and equipment.

4.4.3 Pump Room Cleaning, Inspection and Closure

Once piping and equipment are removed from the pump chamber, Foster Wheeler Environmental will clean the chamber using steam cleaners with extensions. The cleaning water generated will be transferred to the holding tank for treatment. After cleaning, the chamber will be inspected using the same method as described in section 4.3.7 above.

Foster Wheeler Environmental and the Navy will then inspect the chamber. Following inspection, the Pump Room will be demolished as part of Tank Demolition; see paragraph 4.3.9, above.

4.5 Shunt and Loop Piping Removal

Removal of this piping is required as part of closure operations. This section briefly describes shunt and loop piping removal procedures. Work Package 4 - Shunt and Loop Piping Removal will provide necessary details fully describing these operations.

It is assumed that all on-site utilities have been abandoned. Therefore, it is assumed that no utility relocations will be required, although procedures will include the necessary precautions to identify any existing utilities.

It is also assumed that asbestos insulation is in sufficiently good condition to preclude excessive fragmentation during handling of piping, thereby minimizing the amount of asbestos contaminated soil. It is assumed that sections of the steam piping, with insulation attached may be bagged and disposed of as a unit.

4.5.1 Pump Chambers

Pump chambers are connected to the loop and shunt piping system through a tie-in point at the CT chamber. Pipes and valving within the CT chamber contain asbestos insulation which will require implementation of abatement procedures during removal. No work on the piping will be done until asbestos abatement has been completed and clearance levels achieved and documented. Asbestos abatement will be performed by a subcontractor and procedures will be identified in the asbestos SOW/specification. The SHSP will also address asbestos abatement issues. Asbestos abatement will be performed by a Rhode Island Licensed contractor.

4.5.2 Pipe Draining and Free Liquid Removal

Upon completion of the asbestos abatement piping will be disconnected from the associated equipment. Valves will be removed from the piping and equipment. Liquid in the pipes will be allowed to drain into the pump chamber and will be transferred to the AST for off-site disposal.

4.5.3 Piping Cleaning, Excavation, and Removal

Foster Wheeler Environmental will disconnect the shunt and loop pipe fittings located in the CT chamber. The CT chamber concrete lids will be removed. Straight runs of piping between the CT chambers will be cleaned by repeatedly pushing steamjets with pipe cleaning attachments through the pipe. Residuals will be pushed to lined collection points located in the CT chamber catch basin. Oil wastes will be transferred to the temporary AST. Collected water will be transferred to the holding tank for treatment. Subsequently, piping in the CT chamber will be removed. The CT chamber will be cleaned as required. The concrete floor will be broken to permit storm water to drain freely. Finally, the CT chamber will be demolished and filled with sand.

Once the CT chamber is cleaned, Foster Wheeler Environmental will commence excavation to expose buried pipe lines. After the pipe is exposed, asbestos insulated piping will be removed by a licensed asbestos abatement

contractor according to details to be identified by Foster Wheeler Environmental asbestos abatement specifications. The remaining piping will then be cut into manageable lengths, cleaned in place if necessary, and stockpiled for disposal as scrap steel.

4.6 Waste Stream Handling

This section briefly discusses material and waste handling practices to be employed at the site during closure operations. Work Package 5 - Waste Stream Handling, and the Waste Management Plan will provide the necessary details to fully describe the waste and material management practices to be employed.

4.6.1 Soil Handling and Management

Excavated soils generated during buried pipe removal will be segregated according to the field screening techniques outlined in the Waste Management Plan and Sampling and Analysis Plan. Refer to Appendix C and Appendix D. Soil evidencing contamination will be stored within a stockpiled area bermed and lined with 30 mil HDPE. Soil may be stored in one of several stockpiles based on field screening levels of contamination. The stockpiles will be numbered to avoid mixing. Stockpiles will be covered with plastic sheeting at the end of the day and during periods of heavy precipitation. Stock piles will be shaped to permit run off from the cover sheeting. Foster Wheeler Environmental will conduct regular maintenance of the soil storage area during the course of field activities.

The soil placed in stockpiles will be sampled and analyzed according to the Waste Management Plan and Sampling and Analysis Plan. Soils with off-site analytical results indicating Total Petroleum Hydrocarbon (TPH) above 100 ppm will be disposed of off-site in accordance with the Waste Management Plan. Soil with TPH concentrations less than 100 ppm will be reused on site as backfill.

4.6.2 Water Treatment Facility Equipment

The following parameters are assumed for the Water Treatment Facility:

- Influent Concentrations are similar to those from Tank Farm 5;
- Effluent objectives are in accordance with Newport POTW requirements; and
- Flowrate of discharge is an average of 2.3 million gallons per week (100gpm day, 300 gpm night and weekends).
- Electrical area classification will be addressed during Work Package Preparation.

The on-site water treatment system is designed to treat the UST standing water, ring drain water and cleaning/decontamination water. The facility will be designed to treat 2.3 million gallons per week, on a 24 hour per day, 7 day per week basis. Actual throughput will be based upon the Newport POTW flow restrictions. The system as designed will pre-treat the water to meet the discharge criteria of the city of Newport's POTW.

Tank 43 is presently envisioned to be utilized as an influent holding tank. It has been assumed that there is sufficient capacity to allow work to progress without delays due to POTW flow restrictions. It is also assumed that no effluent holding capabilities will be required for sampling prior to discharge.

It is assumed that no construction dewatering associated with excavations will be required to support tank openings and piping removal. The only dewatering anticipated on-site is via the Ring Drain System. The

maximum flowrate for any Ring Drain System to maintain draw down is estimated to be 30 gpm based upon experience on Tank Farm 5.

It is assumed that if dewatering is required during installation of the on-site utilities, the water will not require pre-treatment and will be discharged to a regulated area adjacent to the work area.

The treatment system consists of three major process areas; oil/water separation, filtration, and liquid phase granular activated carbon (GAC) adsorption. Each process step is described in the following subsections. A process flow schematic is shown in Figure 4-1. Water stored with the holding tank will be pumped through the water treatment facility as the POTW rates permit. Three parallel identical process treatment trains will be operated at a design flow rate of 100 gpm each to allow a maximum treatment of 300 gpm total.

Oil/Water Separator: Using a submersible pump, the holding tank contents will be pumped through the oil/water separators, at a design flow of 100 gpm each, to remove free oil remaining in the wastewater. The oil separated from the water in the separator will be periodically pumped to a holding tank for further treatment and/or disposal in accordance with the Waste Management Plan. The Oil/Water separator will be a covered and vented tank, located outside of the proposed water treatment temporary structure.

Filtration: Using Centrifugal Pumps (P-2 A,B,C) the wastewater will be transferred from each oil/water separator through each filtration system at a rate of 100 gpm. Each filtration system will be designed to remove suspended solids down to 20 microns to minimize fouling of the Liquid Granular Activated Carbon System. Each filtration system will consist of parallel connected dual bag filters (F-1 A,B,C). Each filter of the dual system will be sized for 100 gpm to allow filter changeout without taking the filter off-line.

Granular Activated Carbon System (GAC): Following the filtration system, the water will flow through Liquid Granular Activated Carbon Systems. Each system will consist of two 1000 pound GAC vessels connected in series with interchangeable valving.

The effluent water from the GAC system will flow into the effluent tank. From this tank the water will be pumped to a frac-tank (T-2) from which it will be gravity fed into a manhole. Manhole water will gravity flow to a lift station and pumped under pressure into the POTW sewer line. Valving will be designed to permit the GAC effluent to bypass the storage tank, and flow directly into the frac-tank (T-2).

Effluent Holding Tanks: To provide capacity and ensure continued discharge during minor downtimes, an existing UST will be used for effluent holding and a 20,000 gallon frac tank will also be provided.

4.6.3 Water Treatment Facility Temporary Structure Erection

Foster Wheeler Environmental will contract a subcontractor to design and erect a temporary enclosed structure to house the wastewater treatment equipment. This is required to protect the facility as well as to provide noise and lighting controls.

4.6.4 Product and Residuals Disposal

Product and residual from the USTs and pipelines will be collected in temporary ASTs located between the USTs undergoing closure operations. Product and residual recovered from the oil/water separator will be pumped to a frac-tank located outside of groundwater treatment facility to allow potential additional water removal. Tanker trucks will pump product and residual from these intermediate tanks for off-site disposal. The tanker trucks will

transport and dispose of the product and residual according to the Waste Management Plan. Foster Wheeler Environmental will attempt to recover the BTU value of the product/sludge should it prove cost effective.

4.6.5 Wastes Generated from the Wastewater Treatment Facility

Wastes generated from the treatment system and decontamination of treatment equipment will be containerized, sampled and transported by a licensed transporter as identified in the Waste Management Plan and in accordance with DOT regulations. The waste will be disposed of by a RCRA approved treatment/disposal facility or other facility as appropriate. If waste profiles and hazardous waste manifests are necessary they will be drafted by Foster Wheeler Environmental for the Navy's review and approval.

4.7 Demobilization and Site Restoration

Upon completion of UST closure and water treatment operations demobilization and site restoration will be performed. The following subsections provide a brief description of the required activities. Work Package No. 6 - Demobilization and Site Restoration will provide sufficient details fully describing the demobilization and site restoration activities.

4.7.1 Demobilize Water Treatment Plant, Including Temporary Structure

Construction equipment will be decontaminated at the on-site temporary equipment decontamination facility prior to removal from the site. Decontamination water will be treated through the Water Treatment Facility. Upon completion of water treatment, the facility will be decontaminated and dismantled. Spent filter bags and spent carbon will be containerized for disposal as appropriate and according to the Waste Management Plan.

The temporary structure will be decontaminated, dismantled and prepared for shipping.

4.7.2 Demobilize Support Facilities and Equipment

Utility connections to the water treatment facility, support zone and the security trailer will be dismantled. Finally, trailers will be removed from the site.

4.7.3 Site Restoration

Areas of the site which have been disturbed and not restored under other work packages will be restored prior to completion of the project. Upon removal of the temporary facilities and support zone, crushed stone beds and other foundation structures will be excavated and disposed of off-site. Disturbed areas will be graded, covered with topsoil and revegetated. Appropriate sedimentation and soil erosion controls will be implemented until revegetation is completed.

The access and loop road will be repaved as necessary. The off-site, overhead electrical supply to the site will remain intact. However, the on-site electric feed, water/sewer and telephone services will be removed and the utility corridor regraded and revegetated.

SITE DEWATERING

STORM WATER

TO CULVERT

DECON WATER — 60 GPM/1800 GPD/7200 GPW — 4 DAYS/WEEK
FROM DECONTAMINATION WASH AREA

GROUND WATER — 150 GPM/216,600 GPD/1,512 000 GPW — CONTINUOUS
FROM RING DRAIN SYSTEM (5 TANKS)

WASH WATER — 28 GPM/15,120 GPD/60 480 GPW — 4 DAYS/WEEK
FROM WASHING 3 TANKS AND 1 VAULT

CONTAMINATED WATER — 8 GPM/2880 GPD/11 520 GPW — 4 DAYS/WEEK
FROM PIPEWASH SYSTEM

PEAK CONTINUOUS 1 603,240 GPW

PER TANK 1,530 000 GAL/TANK

GROUND WATER — 100 GPM/30,000 GPD — 30 000 GAL PER TANK
FROM EXISTING PUMP VAULT

CONTAMINATED WATER — 750 GPM/1 080 000 GPD — 1,500,000/TANK
FROM EXISTING TANK

SUPPLY CONNECT (TYP.)

SP-1D SP-1A SP-1B SP-1C

UST-43
EXISTING UNDERGROUND STORAGE TANK
2.69 MILLION GALLONS

SP-1A/B/C/D
SUMP PUMPS
100 GPM (EACH)
(INCLUDES INSTALLED SPARE)

S-1A — P-2A — F-1A — F-2A — GAC-1A — GAC-2A

S-1B — P-2B — F-1B — F-2B — GAC-1B — GAC-2B

S-1C — P-2C — F-1C — F-2C — GAC-1C — GAC-2C

BY SUBCONTRACTOR

LAHH
LAH

T-2 AND T-3
FRAC TANKS
21000 GALLONS EA.

TOTALIZING FLOW METER

WEEKDAYS 6:00AM TO 6:00PM 100 GPM
6:00PM TO 6:00AM 300 GPM
SATURDAY, SUNDAY & HOLIDAYS 300 GPM
7 DAYS/WEEK
2 304 000 GPW

MANHOLE

LIFT STATION

SP-3A SP-3B

UST-44
EXISTING UNDERGROUND STORAGE TANK
2 69 MILLION GALLONS

SP-3A/B
SUMP PUMPS
300 GPM (EACH)

WATER
FROM ASBESTOS ABATEMENT

WATER — 28 GPM/3,010 GPD/12,040 GPW — 4 DAYS/WEEK
FROM PERSONEL SHOWERS

F-3
FILTER SYSTEM
TO 5 MICRON

S-1A/B/C
OIL/WATER SEPARATOR
100 GPM (EACH)

P-2A/B/C
FILTER FEED PUMPS
100 GPM (EACH)

F-1A/B/C
F-2A/B/C
DUAL FILTER BAG SYSTEM
100 GPM (EACH)
(PARALLEL OPERATION)

GAC-1A/B/C
GAC-2A/B/C
GRANULATED ACTIVATED CARBON FILTERS
100 GPM (EACH)
(SERIES OPERATION)

PREPARED BY
FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE BOSTON MASSACHUSETTS 02210

FIGURE 4-1

Naval Education and Training Center
Newport, Rhode Island

PROCESS FLOW DIAGRAM

SCALE: AS SHOWN | PROJ. NO. 1284.0013.0103

1284PFD1.DWG
4/16/98

5.0 CLOSE-OUT

Close-out tasks include UST closure inspections, closure reports and preparation of post project plans. Each of these tasks are discussed below.

5.1 UST Closure Inspections

As required by the Rhode Island Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Material, RIDEM must be notified prior to/and subsequent to cleaning each UST. RIDEM will schedule an inspection of the UST in order to verify that the UST has been cleaned, as detailed in subsection 4.3.7 (RIDEM Closure Inspection). During this inspection Foster Wheeler Environmental will obtain the photographs and video of the UST as discussed in subsection 4.3.8 (Documentation of Cleaning).

5.2 Closure Assessment Reports

As required by the Rhode Island Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Material, Foster Wheeler Environmental will compile a Closure Assessment Report for each UST which is closed. The report will comprise data obtained during the closure activities as well as the Preliminary Closure Assessment Report for Tank Farms 4 and 5 (HNUS, June 1995). The performance of other closure assessment activities defined in Rhode Island Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Material (such as soil sampling around the USTs or groundwater well installation and monitoring) are not within this scope of work.

5.3 Post Project Plans

In addition to the UST Closure Reports, red-lined markups of permanent installations will be provided as record drawings to The Navy at Project Completion. Additionally, a brief close-out letter summarizing activities completed as well as addressing any outstanding issues will be prepared. Foster Wheeler Environmental is prepared to meet with the Navy and discuss any additional requirements for Project Close-out.

6.0 PROJECT PLANS

The following Project Plans are a part of this Work Plan and are attached as appendices:

Appendix A Environmental Protection Plan (EPP)
Appendix B Waste Management Plan (WMP)
Appendix C Sampling and Analysis Plan (SAP)

Appendix A

Environmental Protection Plan (EPP)

US NAVY NORTHERN DIVISION
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-94-D-0398
DELIVERY ORDER NO. 0013

ENVIRONMENTAL PROTECTION PLAN

TANK FARM NO. 4 REMEDIAL ACTIONS
NAVAL EDUCATION AND TRAINING CENTER (NETC)
NEWPORT, RHODE ISLAND

April 1996

Prepared by

Foster Wheeler Environmental Corporation
470 Atlantic Avenue
Boston, MA 02210

Revision	Date	Prepared By	Approved By	Pages Affected
1	5/20/96	D. Murphy	M. Zizza, P.E.	1

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FIGURES

ATTACHMENTS

1.0 PURPOSE

This Environmental Protection Plan (EPP) is required by the Contract for the remedial activities to be conducted by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) at the Naval Education & Training Center (NETC) Tank Farm No. 4 located in Portsmouth, Rhode Island. Foster Wheeler Environmental identified three areas of concern to be included in the EPP. These areas are soil erosion and sedimentation control, noise and light abatement, and spill prevention and discharge control.

2.0 SITE LOCATION

Tank Farm No. 4 (the Site) is located approximately 25 miles southeast of Providence, Rhode Island in the Town of Portsmouth in Newport County, as shown in Figure 2-1. The Site is bordered by the following: Defense Highway to the west, undeveloped woodlands to the north, and residences to the east and south. The Site slopes to the west-southwest and is at an elevation of approximately 20 to 112 feet above mean sea level. Narragansett Bay ranges from 500 to 1,000 feet to the west of the Site. Norman's Brook is located in the southwestern portion of the Site and discharges directly into Narragansett Bay. NETC Tank Farm No. 3 and Tank Farm No. 5 are located to the north and to the south, respectively. Refer to Figure 2-2 for the Site Plan.

3.0 PROJECT DESCRIPTION

Tank Farm No. 4 consists of approximately 90 acres of open land containing 12 large reinforced concrete underground storage tanks (USTs) owned and controlled by the Navy. The tank farm was constructed in 1941 and was used to store liquid petroleum products until abandonment in the 1970s. In 1992, the State of Rhode Island enacted regulations for underground storage facilities. Consequently, the tanks at Tank Farm No. 4 became subject to the relative closure requirements. Following enactment of the new UST regulations, the Navy initiated the process for permanent closure of the tanks.

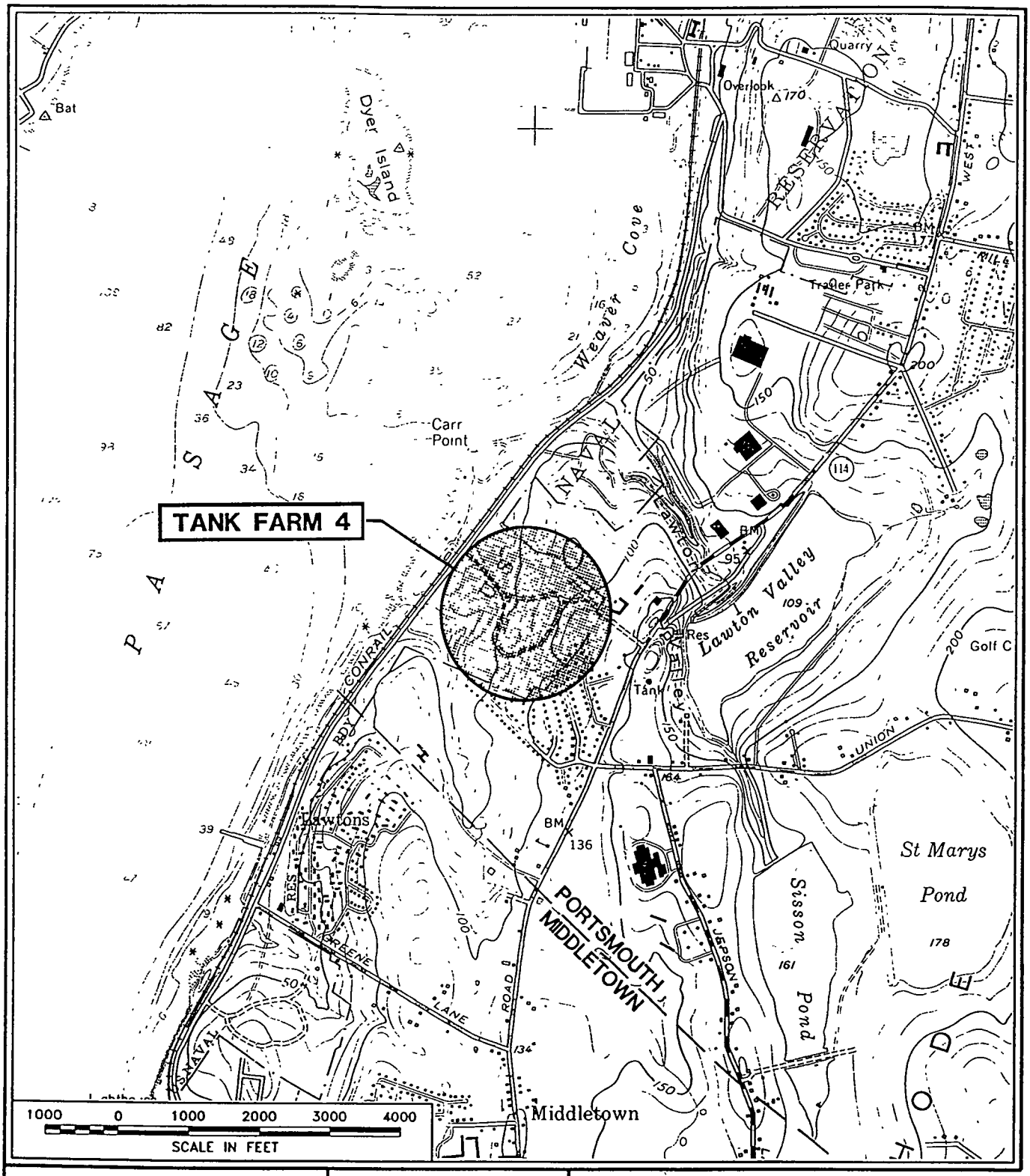
Under Delivery Order No. 0013 of Remedial Action Contract N62472-94-D-0398, Foster Wheeler Environmental was selected as the Contractor to complete the closure of the USTs at Tank Farm No. 4. Closure activities will include the removal and disposal of UST contents, pump room cleaning and equipment removal, and UST cleaning and repairing. Activities will also include removal and disposal of associated "shunt and loop" piping and the removal of a concrete oil/water separator. A final tank closure assessment report will be submitted to RIDEM for each UST once all activities have been completed.

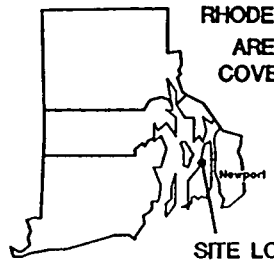
4.0 NOISE AND LIGHT ABATEMENT PLAN

Foster Wheeler Environmental is aware of the proximity of residential properties around the project site. Site operations will be conducted with this awareness kept in mind.

The following activities, procedures and equipment will be used to minimize noise and light pollution:

- Site construction operations will be conducted between the hours of 7:00 am and 7:00 pm;
- Water treatment operations will be conducted on a 24 hour per day basis;





N

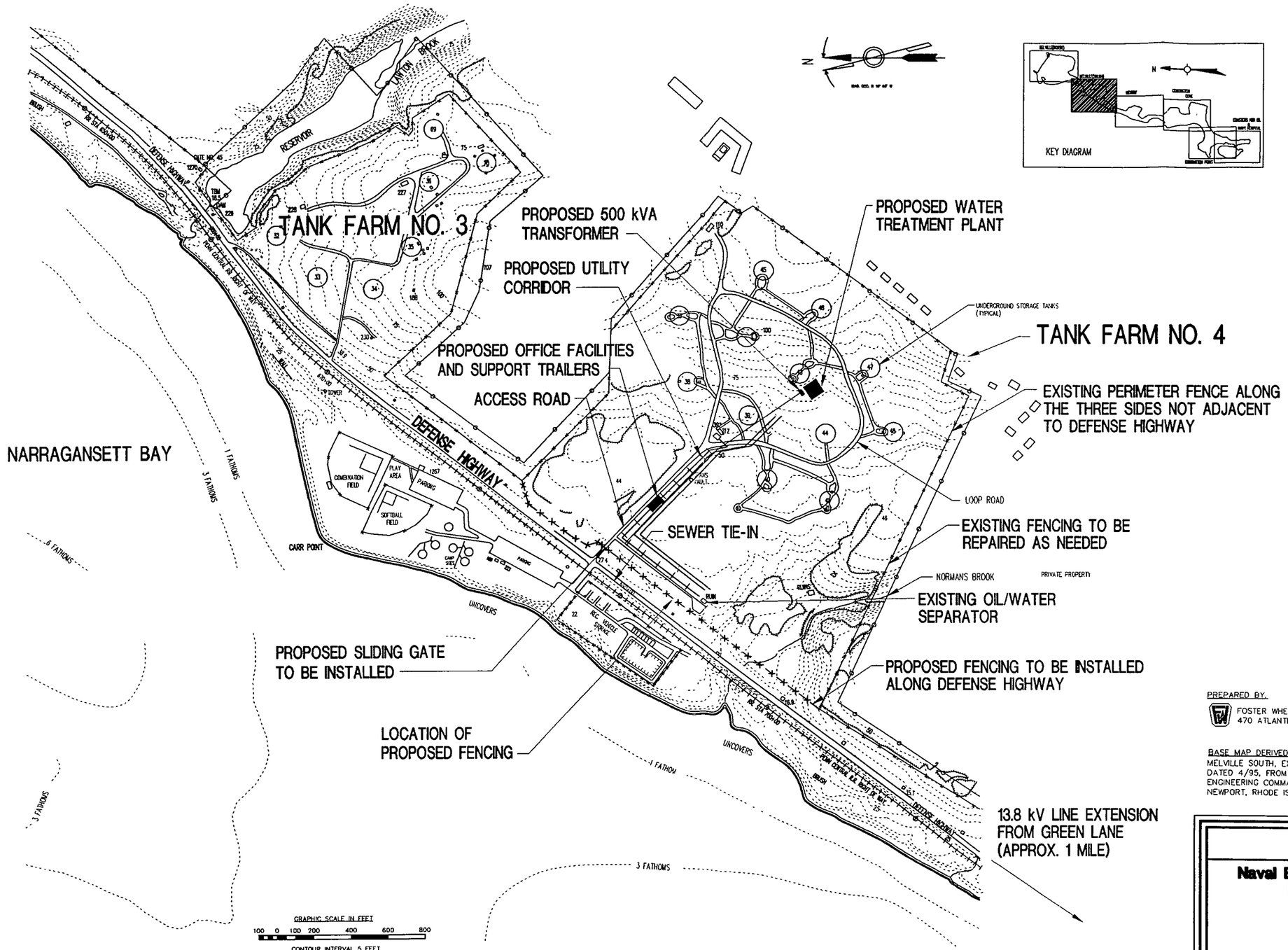
FIGURE 2-1

Naval Education and Training Center
Newport, Rhode Island

SITE LOCATION MAP

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE:1284FG11 DWG



GRAPHIC SCALE IN FEET

100 0 100 200 400 600 800

CONTOUR INTERVAL 5 FEET

PREPARED BY:

FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE, BOSTON, MASSACHUSETTS 02210

BASE MAP DERIVED FROM:

MELVILLE SOUTH, EXISTING CONDITIONS MAP NETC DWG 31062-307 DATED 4/95, FROM THE DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND, EDUCATION AND TRAINING CENTER, NEWPORT, RHODE ISLAND

FIGURE 2-2

Naval Education and Training Center Newport, Rhode Island

SITE PLAN

SCALE: AS SHOWN | **PROJ. NO. 1284.0013.0103**

1284FG12.DWG
4/16/96

- An enclosure may be erected over the temporary water treatment facility which would keep noise and light from propagating off-site. In the event an enclosure for the temporary water treatment system is not installed, noise dosimetry will be conducted at the site perimeter to determine background and operational levels. If necessary, localized enclosures will be installed to reduce operating noise levels;
- Generators used at the site will be of specific manufacture which produces a minimum of noise output (i.e., WhisperWatt or Equal). Noise dosimetry will be conducted at the site perimeter to determine background and operational levels;
- Pump motors used at the site which may require noise abatement will be fitted with localized enclosures to minimize the noise output; and
- Exterior lighting for security or safety purposes at the temporary water treatment facilityor at the trailer complex will be kept minimal and will be focused away from the residential areas.

5.0 SOIL EROSION AND SEDIMENTATION CONTROL PLAN

This plan is presented in a "stand alone" format as Attachment 1 to allow for subsequent submission by the Navy to the appropriate approving authority.

6.0 SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

This plan is presented in a "stand alone" format as Attachment 2 to allow for on-site posting in the field office.

Attachment 1

Soil Erosion and Sedimentation Control Plan

U.S. NAVY NORTHERN DIVISION
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-94-D-0398
DELIVERY ORDER NO. 013

SOIL EROSION AND SEDIMENTATION CONTROL PLAN

TANK FARM NO. 4 REMEDIAL ACTIONS
NAVAL EDUCATION AND TRAINING CENTER (NETC)
NEWPORT, RHODE ISLAND

April 1996

Prepared by

Foster Wheeler Environmental Corporation
470 Atlantic Avenue
Boston, MA 02210

Revision	Date	Prepared By	Approved By	Pages Affected
1	5/20/96	D. Murphy	M. Zizza, P.E.	2

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FIGURES

1.0 GENERAL DESCRIPTION

1.1 Purpose

State of Rhode Island General Laws 1956 (as amended 1990) Title 45, Chapter 46, Sections 1 through 7 "Soil Erosion and Sediment Control Act" requires preparation, submission, review and approval of an Erosion and Sediment Control Plan through the building official of the locality. This plan describes soil erosion and sedimentation controls to be implemented during remedial activities at Tank Farm No. 4. Controls will be in accordance with applicable project documents. Foster Wheeler Environmental has been directed by the ROICC to submit the plan to the Navy for subsequent submission to the locality.

1.2 Existing Site Conditions

The vegetation at the site consists of mainly dense undergrowth and grasses on a gently contoured slope. With the exception of the site perimeter, few large trees exist as the site was active until the 1970's. The highest elevation is approximately 115 feet above the shore line. The distance from the high point at the extreme east side of the site to the shore line is approximately 2,500 feet, resulting in an average grade of approximately 5 percent. Existing drainage features have been obscured by the vegetation. Approximately three areas of the site (approximately 150 feet x 150 feet) each have been cleared at UST locations by previous contractors who either performed investigation or commenced UST closure operations.

1.3 Adjacent Areas

Defense Highway borders the westerly side of the site. Narragansett Bay is located 500 to 1,000 feet to the west and Norman's Brook is located at the southwest corner of the site. A residential area is located south and east and undeveloped woodlands are located north/northeast of the site. Located to the south and to the north are Tank Farm No. 5 and Tank Farm No. 3, respectively.

1.4 Sensitive Areas

Given the gentle slope of the site, no serious erosion problems are expected. Possible wetlands associated with Normans Brook at the southwest corner of the site, stormwater drainage swales adjacent to the Defense Highway and a small stream adjacent to the site entrance road are currently being assessed by the wetlands delineation. Clearing will only be performed in areas necessary to execute the remedial actions and install support areas. This will generally consist of an area of approximately 200 feet in diameter at each tank and a strip approximately 40 feet wide over the shunt and loop pipe runs. Additionally, grubbing will be limited to specific stumps which may interfere with the above mentioned activities. Clearing and grubbing is not expected to be performed within the wetlands or their associated protection zones.

As work at each tank is completed and areas are restored to their original grade, revegetation will be accomplished by hydroseeding the disturbed areas. Natural cover will be allowed to grow and revegetate the site over time.

1.5 Stormwater Management

Information received from the NETC (Environmental Code 40E) indicates that stormwater runoff/stormwater discharge from Tank Farm No. 4 falls under the facility's stormwater discharge permit. It is not expected that the site activities will result in increased peak rates of runoff. No flooding or channel degradation downstream is anticipated.

Stormwater management will be accomplished through installation of drainage swales and culverts to allow runoff to pass under the site access and loop road as necessary. If necessary, sediment traps will be installed prior to the runoff passing through the existing culverts to the Navy stormwater discharge point.

Prior to the commencement of construction activities at each area (i.e., USTs, support zone), erosion and sediment control measures will be implemented. These controls will include:

- Installation of silt fence along the downgradient side of each tank's construction area;
- Construction of a petroleum impacted soil stockpile area with a hay bale berm to retain soil. Stockpiled soil will be placed on a geomembrane liner and covered with 6 mil plastic sheeting secured with hay bales/sand bags; and
- Construction of a stabilized construction entrance consisting of stone and filter fabric to minimize dust generation from construction vehicles.

Foster Wheeler Environmental will maintain these controls for the duration of the project.

2.0 PROJECT ACTIVITIES

To accomplish the goal of cleaning and closure of the oil storage tanks and associated remedial activities at Tank Farm No. 4, the following land disturbing activities will be undertaken:

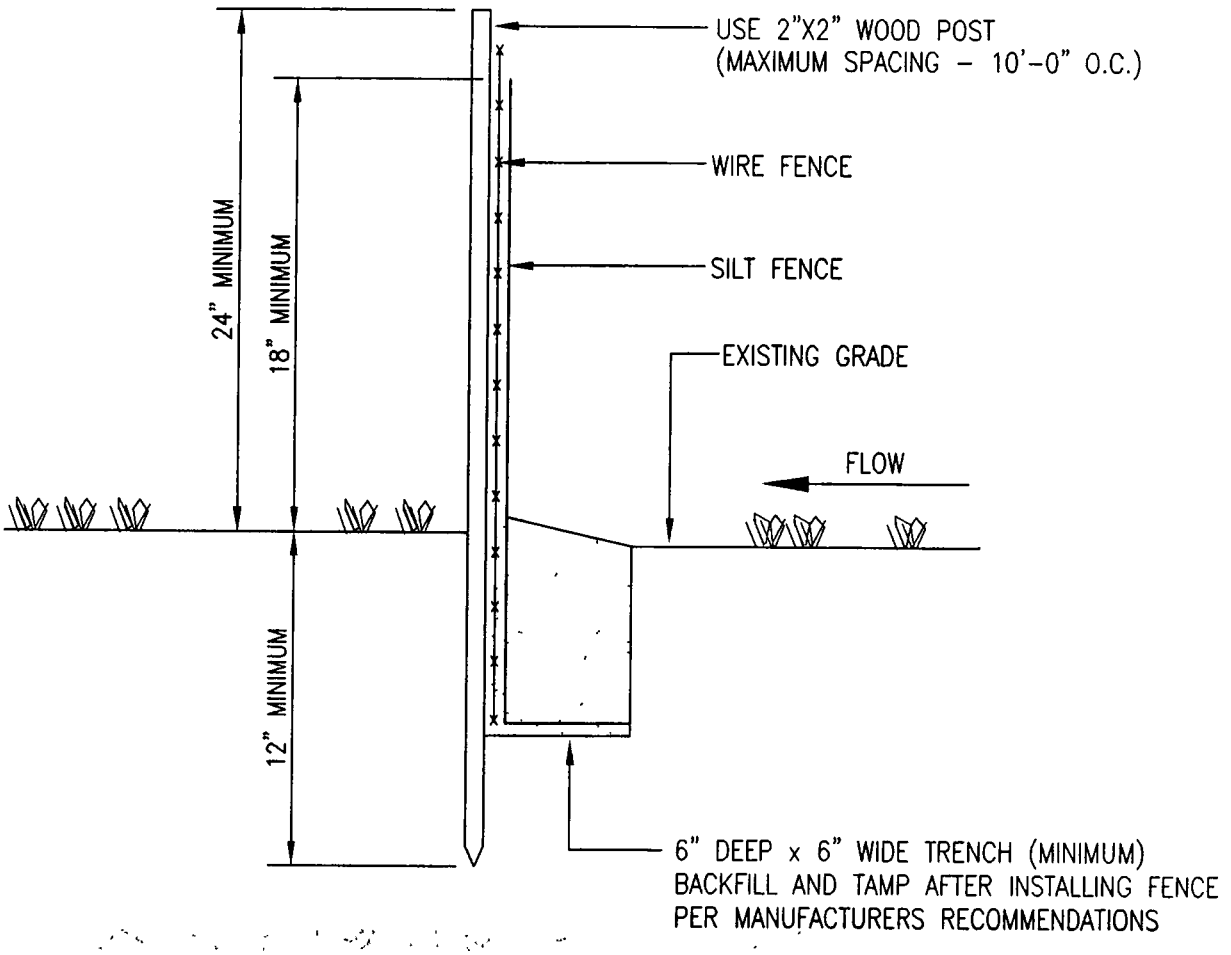
- Utility pole installation along Defense Highway;
- Work area, fence line and utility corridor mowing to allow personnel and equipment access;
- Support utilities (water, sewer, electrical) installation along the entry road;
- Installation of a fence line across the front of the site;
- Leveling and installation of a lined, stone apron for siting the temporary treatment plant;
- Installation of a small office/storage trailer complex;
- Repairing and improving the site roads;
- Two excavations (approximately 20 feet x 20 feet each) to expose work access areas at the top of each UST;
- Excavation to allow removal of existing tank farm shunt and loop piping; and
- Oil/Water separator demolition

2.1 Site Preparation

During site preparation, erosion and sediment controls will be installed at existing site drainage features prior to clearing and mowing. Due to the thick vegetation, additional erosion and sedimentation controls will not be installed until immediately after mowing and clearing operations. Control measures will consist of limitation of clearing and mowing, and installation of silt fence/barriers. Mowed materials and cleared brush will be used to provide surface protection along heavily sloped areas which may be created. Stormwater controls will consist of hay bale/silt fence filtration of surface run-off through culverts. Typical details are shown on Figures 2-1 and 2-2. Planned locations of erosion control measures are shown on Figure 2-3. Actual locations of control measures will be based upon field conditions. Erosion controls will be inspected weekly and maintained as required.

2.2 Soil Staging Activities

The soil staging area will be used to stockpile petroleum impacted soils. Stockpiled soils will either be reused as backfill or disposed of off-site. The soil stockpile area will be constructed prior to any excavation work.



TYPICAL SILT FENCE DETAIL

NOT TO SCALE

NOTES:

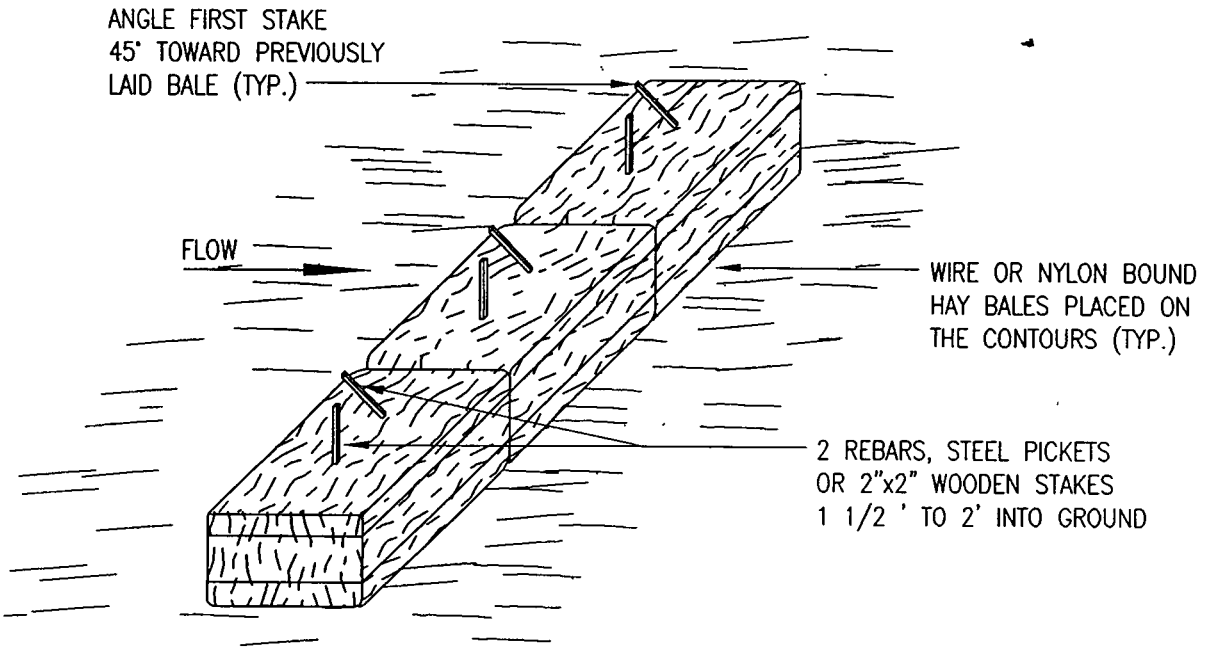
1. FILTER FABRIC SUPPORT SHALL BE WOOD POSTS WITH POLYPROPYLENE FENCE
2. WIRE FENCE SHALL BE A MINIMUM OF 14 GAUGE AND SHALL HAVE A MAXIMUM MESH SPACING OF 6 INCHES. WIRE FENCE SHALL EXTEND TO THE FULL HEIGHT OF THE SILT FENCE
3. FILTER FABRIC AND WIRE FENCE SHALL BE SECURELY FASTENED TO THE STAKES

FIGURE 2-1

Naval Education and Training Center
Newport, Rhode Island

SILT FENCE DETAIL

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103



TYPICAL HAY BALE DETAIL

NOT TO SCALE

NOTES:

1. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.

2. INSPECTION SHALL BE ONCE EACH WEEK AND WITHIN 24 HOURS OF A STORM EVENT YIELDING 0.5 INCHES OF PRECIPITATION IN A 24 HOUR PERIOD. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

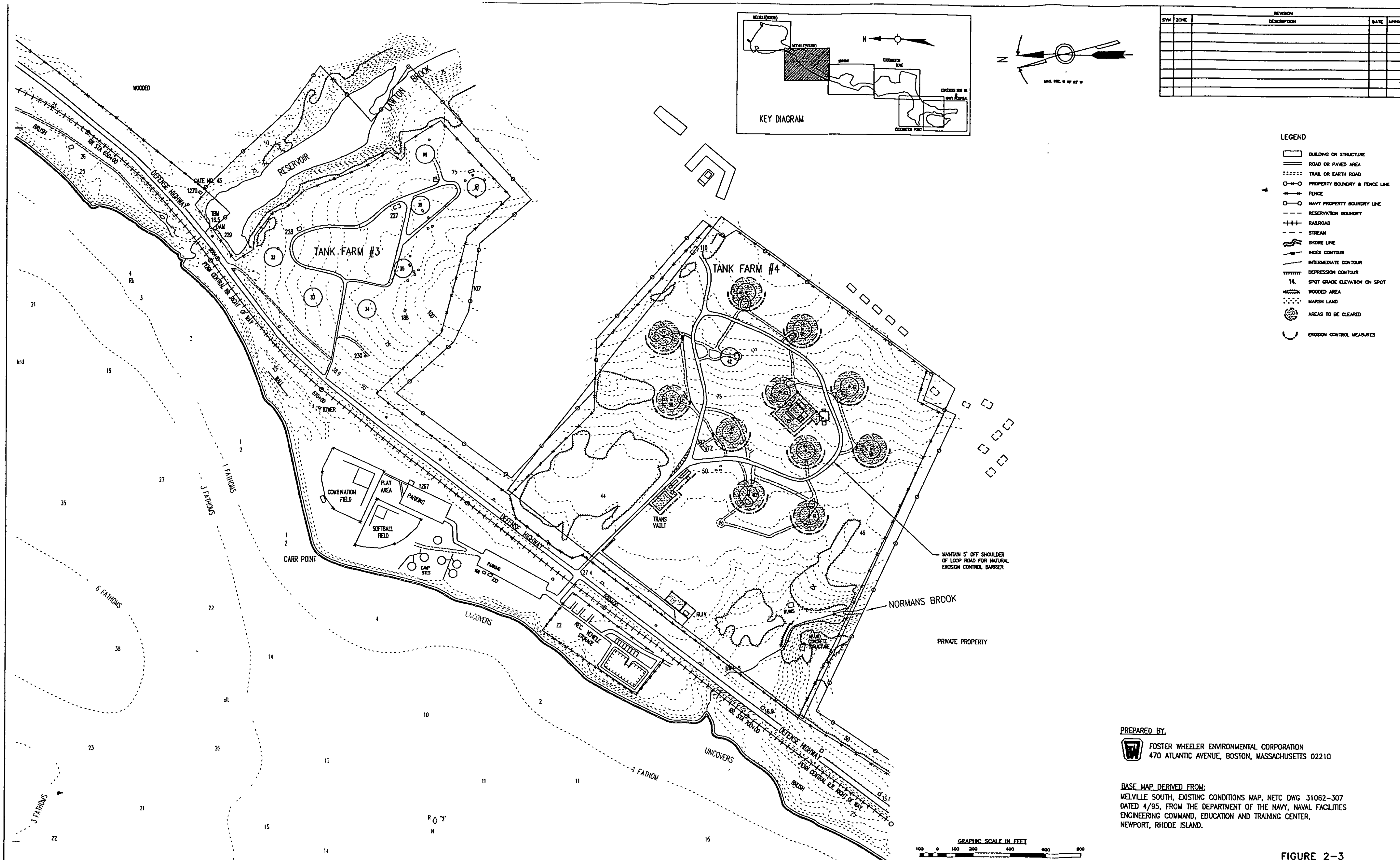
3. BALES SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN THEY HAVE SERVED THEIR INTENDED PURPOSE SO AS NOT TO IMPEDE STORM FLOW OR DRAINAGE. REMOVE ACCUMULATED SILT AND DISPOSE OF IN A PROPER MANNER.

FIGURE 2-2

Naval Education and Training Center
Newport, Rhode Island

HAY BALE DETAIL

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103



PREPARED BY:

FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE, BOSTON, MASSACHUSETTS 02210

BASE MAP DERIVED FROM:
MELVILLE SOUTH, EXISTING CONDITIONS MAP, NETC DWG 31062-307 DATED 4/95, FROM THE DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND, EDUCATION AND TRAINING CENTER, NEWPORT, RHODE ISLAND.

FIGURE 2-3

FOSTER WHEELER ENVIRONMENTAL CORPORATION
BOSTON, MASSACHUSETTS 02210

DEPT	DESIGNED FPZ	PREPARED FPZ	CHECKED	APPROVED	DATE 4/18/96
SCALE 1"=200'	DRAWING NUMBER 1284.0013.C1	CAD FILE NUMBER: C1-FIG.DWG	SH OF		REV

NETC DWG. NO XXXXXX
DSGN XXXXX
DR. XXXX
BR.
DIR.
APPROVED DATE
SATISFACTORY TO
DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL EDUCATION AND TRAINING CENTER
NEWPORT, RHODE ISLAND

TANK FARM 4 CLOSURE
NAVY REMEDIAL ACTION CONTRACT
DELIVERY ORDER NO.13
PLANNED LOCATIONS OF EROSION CONTROL MEASURES

SIZE F | CODE IDENT NO. 80091 | NAVFAC DRAWING NO.
CONSTR. CONTR. NO. XXXXX
SCALE: XXXX | SPEC. XXXXX | SHEET X OF X

The petroleum impacted soil stockpile area will be lined with a 30 mil geomembrane on which excavated soils will be placed. The liner will extend over and beyond hay bales positioned and staked around the perimeter of the stockpile area and secured with sand bags. The hay bales will create a berm to retain soils. Additionally, 6 mil plastic sheeting will be placed over the stockpiled soils after each day and during precipitation events. The plastic sheeting will be secured in place with hay bales or sand bags. Clean soil stockpiles areas adjacent to excavations will be surrounded with hay bales and silt fence if necessary.

2.3 Temporary Treatment Plant Construction

The temporary treatment facility will be constructed adjacent to tank no. 43. Minor grading may be necessary to create a level surface to place the equipment. The entire treatment facility area will be excavated and bermed. The excavation will be lined with geomembrane and filled with crushed stone. A temporary structure may be placed over the majority of the process equipment, preventing stormwater run-on.

2.4 Tank Contents Removal

Excavation will be required to access the top of each tank. Excavated soils will be staged and reused as clean backfill. Excavation will not occur until the stockpile areas are constructed. Silt fence/hay bales will be installed along the downgradient slope as necessary to remove solids from run-off.

2.5 Shunt and Loop Piping Removal

Excavation will be required to access the shunt and loop piping for removal. Excavated soils will be staged and reused to the extent possible as clean backfill. Excavation will not occur until the stockpile areas area constructed. Silt fence/hay bales will be installed along the downgradient slope as necessary to remove solids from run-off.

2.6 Miscellaneous Trench Excavation

Excavation to install utilities and miscellaneous process piping will be required. Excavated soils will be reused as clean backfill. Silt fence/hay bales will be installed along the downgradient slope as necessary to remove solids from run-off.

2.7 Site Restoration

Upon completion of remedial tasks associated with this project, the site will be restored. Disturbed areas will be regraded and revegetated as necessary to establish growth sufficient to prevent erosion or sedimentation. Removal of the silt fence and hay bales will be the final task associated with construction activities. Trapped silt will be disposed of off-site.

3.0 MAINTENANCE PROGRAM

Routine inspection of the erosion control measures will be conducted. A special effort will be made to inspect immediately prior to and following significant rainfall events. Restabilization, repair or reconstruction of damaged control measures will be conducted as required based on the inspection results. Any sediment which is removed from the control facilities will be used as backfill at the tank cleaning work areas. Disposal of the temporary control measures will be in accordance with regulations identified in the Waste Management Plan and will be accomplished after revegetation or stabilization. A water truck will be used as needed to control fugitive dust emissions from all site activities.

Attachment 2

Spill Prevention Control and Countermeasure Plan

US NAVY NORTHERN DIVISION
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-94-D-0398
DELIVERY ORDER NO. 0013

DRAFT
SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

TANK FARM NO. 4 REMEDIAL ACTIONS
NAVAL EDUCATION AND TRAINING CENTER (NETC)
NEWPORT, RHODE ISLAND

April 1996

Prepared By

Foster Wheeler Environmental Corporation
470 Atlantic Avenue
Boston, MA 02210

Revision	Date	Prepared By	Approved By	Pages Affected
1	5/20/96	R. Donati, P.E.	Michael Mizza, P.E.	2

FOREWORD

This Spill Prevention Control and Countermeasure (SPCC) Plan for NETC - Newport Tank Farm No. 4 has been prepared in accordance with U.S. Environmental Protection Agency (EPA) regulations found in title 40, Code of Federal Regulations (CFR), 1993 rev, Part 112, Oil Pollution Prevention

MANAGEMENT APPROVAL

The contents of this SPCC Plan have been reviewed and will be followed at NETC-Newport for Tank Farm No. 4 Remedial Actions in accordance with 40 CFR Part 112. Any amendments shall be effective upon certification by a Registered Professional Engineer in accordance with 40 CFR Part 112.3.

Signature: _____

Name: _____

Title: _____

CERTIFICATION

I hereby certify that I have examined the facility and, being familiar with the provisions of 40 CFR Part 112, I attest that this SPCC Plan has been prepared in accordance with good engineering practices and the requirements of these regulation, and is adequate for this facility.

_____
Printed Name of Registered Professional Engineer

_____
Signature of Registered Professional Engineer

Date: _____

_____
Registration Number State

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

This Spill Prevention Control and Countermeasure (SPCC) Plan has been prepared in accordance with U.S. Environmental Protection Agency (EPA) Oil Pollution Prevention Regulations as found in Title 40, Code of Federal Regulations (CFR), Part 112. This SPCC Plan addresses only the remedial construction activities performed by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) for the U.S. Navy under Delivery Order No. 13, Contract No. N62472-94-D-0398, at the Naval Education & Training Center (NETC) Tank Farm No. 4 in Portsmouth, Rhode Island ("the facility").

The objectives of this SPCC Plan are to provide a description of the oil storage and operational procedures at this facility under Delivery Order No. 13, and to outline all of the equipment, appurtenances, and procedures available to prevent the discharge of oil in harmful quantities, as defined in 40 CFR Part 110, from reaching the navigable waters of the United States or adjoining shorelines. In addition, the SPCC Plan provides guidelines for any spill to ensure that prompt emergency response actions are initiated. A copy of this SPCC Plan, including response instructions and emergency telephone numbers will be posted at the field office.

Discharges of oil into navigable waters are defined in 40 CFR Part 110 as "harmful to the public health or welfare of the United States" when discharges "(a) violate applicable water quality standards, or (b) cause a film or sheen upon or discoloration of the surface water or adjoining shoreline or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines."

2.0 GENERAL INFORMATION

2.1 Facility Information

Name:	Naval Education & Training Center (NETC - Newport), Tank Farm No. 4
Type:	Active military installation
Location:	Defense Highway Newport County, Portsmouth, Rhode Island
Owner/Operator:	U.S. Navy Northern Division

Designated Person Accountable For Oil Spill Prevention at the Facility:

During Day Operations (7:00 am to 5:00 pm)

Name:	Jon Cary
Title:	Site Manager
Phone:	TBD (field office phone)

During Night Operations (5:00 pm to 7:00 am)

Name:	TBD
Title:	Site Superintendent
Phone:	TBD (field office phone)

Designated Person Reports to:

Name:	John Holwell
Title:	Project Manager
Phone:	(617) 457-8234

Date(s) of Facility Operation: 1996 (for activities under Delivery Order No. 13)

2.2 Facility Description

2.2.1 Site Description

NETC-Newport is located in the Towns of Newport, Middletown, and Portsmouth, Rhode Island, approximately 25 miles southeast of Providence. Tank Farm No. 4, which occupies approximately 90 acres, is situated at the northern portion of NETC-Newport, in Portsmouth, and is accessed from Defense Highway (see Figure 2-1). Topographic maps indicate that Tank Farm No. 4 is located approximately 500 to 1,000 feet east of Narragansett Bay. Tank Farm No. 4 is bordered by Defense Highway to the west; Normans Brook to the southwest; residential property to the southeast; and undeveloped woodlands to the north/northwest.

Tank Farm No. 4 contains 12 large underground storage tanks (USTs), numbered Tank 37 through Tank 48, which were constructed by the U.S. Navy in 1941. These tanks were used to store virgin heavy fuel oil (No. 6 bunker oil). Several tanks were reportedly used to store No. 2 heating oil during the mid-1970s up until 1978. Access to Tank Farm No. 4 is restricted. Perimeter fencing is installed around the site except along Defense Highway. A paved access road leads into the farm, passing between the tanks in a loop.

On-site structures include remnants of a building, a decommissioned electrical substation, and an abandoned oil/water separator. Ground elevations across Tank Farm No. 4 range between 46 feet and 111 feet above mean low water. Topography gradually slopes to the west/southwest, toward Normans Brook and ultimately Narragansett Bay. The central portion of the farm is vegetated with tall grass, dense brush, and trees. Dense brush and woodlands cover the perimeter areas of the farm. Brush at three tanks has been cleared during investigations and cleaning.

2.2.2 Project Operations

As a result of the revised UST regulations enacted by the State of Rhode Island in 1992, the tanks became subject to closure requirements. The Navy, therefore, initiated the process for permanent closure of the tanks at Tank Farm No. 4.

Remedial actions performed by Foster Wheeler Environmental under contract with the U.S. Navy (Contract No. N62472-94-D-0398, Delivery Order No. 13), include removal and disposal of UST contents, pump room cleaning and equipment removal, followed by UST cleaning, inspecting, and closure. Activities also include removal and disposal of associated "shunt and loop" piping and removal of a concrete oil/water separator.

The closure of each UST consists of cutting two openings in the top of the tank for access and removing any water in the UST. The water is pumped into Tank #43, which is used as a holding tank, and then pumped through a temporary treatment system consisting of a series of oil/water separators, filters, and granular activated carbon units before ultimate discharge to the Publicly Owned Treatment Works (POTW). The oil product and sludge remaining in the UST are removed and disposed of off-site. To help reduce the viscosity of the residual product and sludge to allow pumping, diesel fuel may be added, as needed. The product is then pumped into two 20,000 gallon frac tanks located adjacent to the UST for temporary storage until being transferred to Vac trucks for removal off-site. The UST and all associated piping and pumps are pressure washed to remove residual product and sludge and the cleaning water is pumped into Tank #43 for treatment.

2.3 Description of Oil Storage

2.3.1 Total Underground Storage

Tank Farm No. 4 contains 12 USTs with a total aggregate storage capacity of approximately 756,000 barrels (31.8 million gallons). Currently, the USTs contain a combination of oil, water, and sludge at between 20% and 96% of the total UST capacity. One of the USTs (Tank 42) has been cleaned and reballasted with clean water under a previous contract. This tank will not be reopened. Table 2-1 lists the capacity of each UST.

2.3.2 Total Aboveground Storage

Up to six (6) 20,000 gallon frac tanks, for a total storage capacity of 120,000 gallons, are on site at one time to temporarily store residual oils (#2 and #6) removed from each UST prior to shipment off-site. Diesel fuel is stored in a 1,000 gallon above ground tank located in the fueling area (see Figure 2-2) and is used for fueling heavy equipment at the site.

Small amounts of gasoline and hydraulic oil (less than 20 gallons), stored in 5 gallon containers approved to hold these materials, are used for fueling vehicles, compressors, and other miscellaneous construction support equipment. Several 55 gallon drums (up to 88) of degreasing solvents, stored in the drum storage area, are used to support UST and equipment cleaning activities. Three oil/water (O/W) separators, each capable of handling 100 gallons/minute flows, are located in the temporary Water Treatment Plant (WTP). Two transformers (500 kVA and 75 kVA), containing small amounts of oil are located outside the WTP and near the site trailers, respectively.

Vac trucks with storage capacities of 5,000 gallons (max) are used to transfer residual oil product off-site from the frac tanks. Diesel fuel is also delivered to the site in 5,000 gallon (max) tank trucks for use as an additive to the USTs to facilitate pumping during product removal.

Table 2-1 provides a list of the oil storage at the facility for facility operations. This table includes the total storage capacity for the existing USTs (for reference only); however, this storage is not covered in this SPCC Plan. It is covered under an existing SPCC Plan for the NETC-Newport facility.

Miscellaneous amounts of oil contaminated debris removed from the USTs and pump rooms are stored in 55 gallon drums in the drum storage area for removal off-site, and oil contaminated soil removed during on-site excavations are stockpiled in the soil stockpile area.

2.4 Facility Drainage

Drainage from undiked areas on Tank Farm No. 4 flows to the west/southwest towards Normans Brook and Defense Highway, which is located approximately 750 feet from the closest tank (Tank 48). Normans Brook flows northwest and ultimately discharges to Narragansett Bay approximately 1,500 feet away. There are no known catch basins located along the access and loop roads to discharge runoff into Narragansett Bay. However, a stream/stormwater drainage swale runs parallel to the north side of the access road and discharges to a culvert running beneath Defense Highway. Additionally, a drainage swale runs parallel to Defense Highway along the western border of the site in the vicinity of the access road.

Drainage from diked areas at the facility are completely contained within those areas; there are no outlets for drainage. Rain water that collects within the diked areas is visually inspected by the Site Manager (Jon Cary) to ensure that, when discharged to the ground, it will not cause a harmful discharge as defined in 40 CFR Part 110.

Rain water that does not meet this discharge criteria is manually removed and pumped into Tank 43 for processing.

2.5 Past Spill History

Since activities covered by this SPCC Plan have not occurred, this section does not apply.

2.6 Site Security

Repairs to the existing chain link fence, installation of new sections of fence, or other methods of securing areas of work will be completed prior to any facility operations to limit site access.

The facility operation for this project is hazardous waste remediation. In order to control the potential spread of contamination throughout the site and assure that only authorized individuals enter potentially hazardous areas during facility operations, Tank Farm No. 4 is divided into three site zones. These zones, established on the work site prior to initiating facility operations, are an Exclusion Zone (EZ), a Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Persons working in the EZ or CRZ will only be allowed access upon approval from the Site Health and Safety Officer (SHSO).

2.7 Personnel Training

2.7.1 Site-Specific Training

Prior to commencing work on the site, field personnel assigned to the project will complete training that specifically addresses the activities, procedures, monitoring, and equipment used in the facility operations. Standard Operating Procedures (SOPs) are also used to provide training for specific tasks. The training includes site and facility layout, hazards and emergency services at the site, and instruction in the proper operation and maintenance of equipment to prevent discharges of oil, highlighting provisions contained within this SPCC Plan. The training also allows field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

2.7.2 On-Site Safety Briefings

Project personnel, subcontractors, and visitors are given on-site briefings prior to the start of each work shift by the Construction Superintendent or Supervisor. The briefings include information on new operations to be conducted that involve handling and/or transfer of oil, changes in work practices or changes in the site's environmental conditions, and periodic reinforcement of the provision in this SPCC Plan.

2.8 Inspections and Records

Routine visual inspections of all oil storage are performed on a daily basis by site and supervisory personnel involved in the transfer operations. The Site Health and Safety Officer will also be tasked with the additional duty to perform inspections as time permits. Oil storage areas (tanks, dikes, valves, etc.) are periodically inspected for signs of spills or leaks, and any problems are reported to the Emergency Response Coordinator (ERC), Jon Cary. The outsides of the frac and diesel tanks are observed for signs of deterioration or leaks which might cause a spill, or accumulation of oil inside diked areas. Visible oil leaks which result in a loss of oil from tank seams, gaskets, rivets, and bolts sufficiently large enough to cause the accumulation of oil in diked areas are promptly corrected. Results of these inspections are recorded in Inspection Forms specific to the site activities.

3.0 DESIGN AND OPERATING INFORMATION

This section provides design and operation information on the oil storage areas and product transfer operations at this facility. Details on secondary containment areas are also provided. Appendix A includes volume calculations for secondary containment areas.

3.1 Bulk Storage Tanks

3.1.1 Frac Tanks

The 20,000 gallon above-ground frac tanks are constructed of double-walled carbon steel or other material compatible with the product stored. The outer wall has the volume capacity to contain at least 22,000 gallons (110%). The tanks may also be equipped with capabilities to monitor the interstitial space between the double walls for leaks, and either a high level alarm or a visual gauge to monitor the tank product level during filling operations. All outside surfaces are painted for corrosion protection, and routine maintenance and inspection are performed on the tank, valves, and piping to prevent corrosion or leaks. As many as six (6) frac tanks may be on-site at any time, and are situated such that two (2) frac tanks could simultaneously support the cleaning of two (2) adjacent USTs. Once the two USTs are cleaned, the frac tanks are moved to support cleaning of other USTs.

The adequacy of double-walled above-ground tanks (ASTs) for secondary containment is not specifically addressed in the current SPCC regulations (40 CFR 112.7). Appendix B contains an EPA Memorandum, dated April 29, 1992, which addresses double-walled shop-fabricated ASTs. While the EPA Memorandum does not provide definitive clarification on this issue, it does provide guidance to EPA Region I personnel to allow consistent interpretation of double-walled shop-fabricated ASTs. According to EPA Region I personnel, the use of double walled tanks as secondary containment is not generally recommended due to (1) the lack of containment from tank overfilling and (2) the inability to monitor the integrity of the inner wall over time. However, given the short duration of activities covered by this SPCC Plan, along with the procedures in place to minimize the risk of tank overfilling (see section 3.4), it was EPA Region I's opinion that double-walled tanks would be adequate.

3.1.2 Diesel Fuel (#2 Oil)

Diesel fuel is stored on-site in a 1,000 gallon above-ground steel tank. The tank is used to fuel heavy equipment and vehicles and is situated in the fueling area (see Figure 2-2), which is surrounded by an earthen berm lined with 30 mil HDPE and capable of containing a minimum volume of 1,100 gallons (110% of the tank).

3.2 Other Oil Storage

3.2.1 Containers and Drums

Gasoline and hydraulic oil are stored in labeled 5-gallon metal "UL-approved" and compatible containers. These containers are stored in a flammable storage metal cabinet. Degreasing solvents are stored in 55-gallon drums in the drum storage area (see Figure 2-2), which is a 20-foot by 20-foot area surrounded by a berm with secondary containment storage capacity 110% of the largest container/drum in the area. The berm consists of lengths of sausage booms covered with soil to keep them in place.

3.2.2 Water Treatment Plant (WTP)

Oil contaminated water collected from the UST cleaning operations is temporarily stored in Tank 43 and then pumped into the Water Treatment Plant (WTP). A flexible hose is used to pump water from Tank 43 to the

WTP, which is located approximately 100 feet away. The concentrations of oil in the water are such that it is unlikely to cause a sheen or discoloration. However, containment and mitigation measures in the event of a spill of this water are addressed in this SPCC Plan.

The WTP operates 24 hours/day, 7 days/week, and an operator is present at all times during operating hours. The operator's responsibilities include inspection of equipment for leaks and/or spills.

The WTP consists of three (3) skids in parallel, each with multiple stage oil/water separators, bag filters, and activated carbon filters with design flows of 100 gallons per minute (gpm). Figure 2-4 is the WTP Process Flow Diagram showing equipment, pumps, and valves.

As currently proposed, the WTP is situated on a 60 mil geomembrane lined, 60 feet by 60 feet bed of crushed stone. Any leaks from the WTP equipment will be channeled via a sloped surface to a sump, which subsequently pumps the leaking material to Tank 43. The lined crushed stone bed will be bermed to prevent storm water run-on. This system will also be used to collect storm water (in the event that no temporary structure is installed) and transfer it to Tank 43 for processing. Two pumps will be available for this operation. (**Note:** The Foster Wheeler Subcontractor procurement process requires that the WTP equipment supplier/installer address spill prevention as well as provide equipment with spill control measures. Therefore, the ultimate design for the WTP may be changed prior to the start of field activities. Any changes will be incorporated in this SPCC Plan.)

3.2.3 Transformers

Two transformers (500 kVA and 75 kVA) have been installed on the site to support construction operations, each containing small amounts of oil. The 500 kVA transformer is situated adjacent to the WTP on a concrete pad. The 75 kVA transformer is mounted on a utility pole adjacent to the office trailers. Due to the minimal volume of oil in these transformers, no secondary containment is provided. Any spills from these transformers will be cleaned up using sorbent materials.

3.2.4 Miscellaneous Oil Contaminated Debris

Though not considered "oil storage", miscellaneous oil contaminated debris encountered during UST and pump room cleaning (concrete, sorbents, etc.) is stored in 55 gallon drums in a bermed 20 foot by 20 foot storage area (see Figure 2-2). Since this is solid waste debris stored in steel drums, no secondary containment is required. Should any drum rupture, the contents will be placed into another drum.

Oil-contaminated soil removed from excavations is stockpiled in the soil stockpile area, located adjacent to the Water Treatment Plant (see Figure 2-2). The stockpiled soil is placed on 30 mil HDPE in a bermed 50 foot by 50 foot area and covered with 6 mil polyethylene.

3.3 Truck Loading/Unloading Operations

Hydraulic oils and solvents are delivered to the facility in cans and drums, respectively, on pallets by delivery trucks. Diesel fuel used both as an additive to the USTs to help facilitate pumping the residual oil product by decreasing the viscosity and to refill the 1,000 gallon diesel fuel tank is delivered to the site in tank trucks. Waste oil from the frac tanks is transported off-site by Vac trucks. The tank trucks and Vac trucks have maximum storage capacities of 5,000 gallons.

Unloading of a tank truck into the diesel tank will only occur when an operator is present. Prior to loading the Vac trucks, all drains and outlets of the truck are checked by on-site personnel to make sure they are closed. Before departure, the Vac trucks are inspected by the on-site personnel for leaks and all transfer lines are

disconnected. Oil remaining in hose is drained into the Vac truck. Before a tank truck is unloaded into the diesel tank, the site operator will estimate the volume available in the tank to avoid overfilling. Before loading or unloading any tank or Vac truck, a physical barrier, such as wheel chocks or a brake interlock system, are used to prevent accidental truck departure. Drip pans and/or sorbents are used during all loading/unloading operations to collect any spilled oil

3.4 Piping, Pumps, and Transfer Operations

Only aboveground piping and/or hoses connected by camlocks are used for oil and water transfer operations. The hoses, which are pressure tested prior to delivery to the site, are rated at 150 psi (min), well above any pressure that is anticipated during site operations. Vehicles entering an area with aboveground piping/hoses are guided by operating personnel to reduce the chance of damaging the piping/hoses and causing a discharge. Tanks, piping, pumps, valves, flange joints, hose connections, and drip pans are inspected regularly by operating personnel for evidence of leaks or discharges. Any leaks or discharges are immediately cleaned up and the source of the leak is repaired.

Two operating personnel are present at all times during oil transfer operations from the USTs to the frac tanks, and from the frac tanks to the Vac trucks. During the removal operations, direct audible or radio communication is maintained between the operator at the pump and the tank gauger at the frac tank or Vac truck. Either the tank/truck is continuously gauged during transfer operations, or a direct read gauge is provided on the tank/truck to monitor the liquid level.

When a pump is initially turned on, personnel walk the entire line checking for any signs of leaks. Vacuum breakers are installed at the pump location to prevent the continual flow of product as a result of suction effects should it become necessary to shut down pumping operations.

Hoses connected with camlocks are used to transfer water from the USTs to Tank 43 and from Tank 43 to the WTP, which operates 24 hours/day, 7 days/week. An operator, who is present at all times at the WTP during operating hours, walks all transfer lines at least every hour during transfer operations. Upon discovery of a leak or discharge, the operator will immediately shut off all pumps, and then initiate emergency response procedures as detailed in Section 4.2.

4.0 SPILL CONTINGENCY PLANS

4.1 Preparedness and Prevention Requirements

The purpose of this section is to demonstrate that Foster Wheeler Environmental Corporation, under contract with the U.S. Navy, is adequately equipped to meet spill prevention requirements. An alarm and communication system is maintained at the facility for emergency activities. On-site equipment and resources are available to respond to emergency incidents and spills, and sufficient off-site resources are available to respond, if needed.

4 1.1 Communication

Hand-held two-way radios are utilized, as appropriate, by field teams for communication with the site supervisory personnel and the Command Post at the site trailers. A telephone is located in the site trailers for communication with emergency support services/facilities. Field teams utilize the buddy system and hand signals communication.

4.1.2 Alarm Systems

Air horns are carried by field teams or are strategically located within the EZ, and are maintained as the means for announcing emergency evacuation procedures and backup for other forms of communication.

4.1.3 Stop Work (Adverse Weather Conditions)

Most of the site activities, except for the operation of the WTP, are limited to daylight hours or when suitable artificial light is provided and to when acceptable weather conditions prevail. In the event of adverse weather conditions, the SHSO or designee will determine if work can continue without potentially risking the safety of field workers. If weather becomes severe, the SHSO will determine the need to cease operations and evacuate.

4.2 Emergency Response Procedures

4.2.1 On-Site Equipment

The following minimum emergency equipment is kept and maintained on-site:

- Air horns (one per field team)
- Fire extinguishers (one per trailer/vehicle)
- Fire blanket
- Two-way radios
- Spill kits (spill control absorbent material, sorbent pads, booms, and shovels) are located at each UST during closure activities (see Figure 2-2)
- Signal flags
- Traffic vests

In addition to the above list, heavy equipment (rubber-tired back hoe, bucket loader, site trucks) is available on-site during the day for use in any spill response activity.

4.2.2 Off-Site Equipment and Resources

Supplementary emergency spill response equipment, supplies, and personnel are available, if needed, from off-site (outside) sources. For smaller emergencies and spill incidents (less than 1,000 gallons on land or 50 gallons into navigable waters), NETC emergency fire and spill response personnel are available to respond. For larger emergencies and spill incidents, local response cleanup contractors are contacted to assist in the response.

4.3 Spill Control and Response

The Emergency Response Coordinator (ERC) for the activities at this facility is Jon Cary. The SHSO (Tom Hawthorne) will serve as the Alternate Emergency Response Coordinator (AERC). All emergencies will be reported to the ERC or AERC, or their designee. The ERC is also the person accountable for oil spill prevention at this facility. The ERC will notify the Project Manager and Site Owner Representatives in the event of an emergency. In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority at the facility is established. The ERC will take charge of emergency response activities and dictate the procedures that are followed for the duration of the emergency. The ERC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his/her discretion, the ERC also may order the closure of the site for an indefinite period.

The ERC will give directions for implementing whatever actions are necessary. Any project team member may be assigned to be in charge of emergency communications during an emergency. He/she will attend the site telephone specified by the ERC from the time the alarm sounds until the emergency has ended.

The ERC activities during an oil spill response include the following:

1. Determine the nature, identity, and amounts of major spill components.
2. Mobilize the necessary response personnel and assemble the required response equipment (protective clothing, heavy equipment, absorbent materials, empty drums, etc.).
3. Make sure all unnecessary persons are removed from the spill area;
4. Stop the flow of oil as much as possible.
5. Determine the most appropriate diking and/or diversionary method to control or contain the spill.
6. Notify key project management and response personnel.
7. Collect and dispose of all spilled product, sorbent material, and contaminated soil in accordance with federal and state regulations.
8. If the spill exceeds state or federal reportable quantities for oil, report the incident to the National Response Center (NRC) and other regulatory agencies, as appropriate.

Small hazardous spills/environmental releases will be contained as close to the source as possible. The ERC will determine the best means of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents will be placed directly on the substance to contain the spill and aid recovery. For a larger spill event, berms of earthen or sorbent materials can be used to contain the leading edge of the spill. Drains or drainage areas will be blocked. An exclusion zone of 50 to 100 feet around the spill area will be established depending on the size of the spill. Given the nature (viscosity) of the oil product being pumped from the USTs during cleaning operations, a spill of this residual oil is not expected to migrate far from the source. The ERC will contact one of the cleanup contractors listed in Section 4.5 for additional cleanup capabilities if warranted based on the size of the spill. Appendix C provides a list of manpower and equipment resources available at Clean Harbors in Providence, Rhode Island.

4.4 Evacuation Plan

Project personnel are instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. A map showing evacuation routes, meeting places, and location of emergency equipment, developed by the field staff, is posted in the trailers and used during site-specific training.

In the event that an emergency occurs that would require evacuation of the site, including but not limited to fire, explosion, or significant releases of oil to the ground and/or navigable waters, an air horn will be sounded on the site. The horn will sound for one continuous blast, signaling that immediate evacuation of all personnel is necessary due to an immediate or impending danger. All heavy equipment and pumps will be shut down and all personnel will evacuate the work areas and assemble at the primary evacuation point. This point is determined by the field staff prior to start of work activities.

After sounding the alarm and initiating emergency response procedures, the ERC will check and verify that access roads are not obstructed. If traffic control is necessary, as in the event of a fire or explosion, a project team member who has been trained in these procedures and designated at the site safety meeting, will take over these duties until local police and fire fighters arrive. The ERC will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation. Periodic evacuation drills may be conducted to test the emergency system.

4.5 Spill Incident Notification Information

Contact	Firm or Agency	Telephone Number
National Response Center (NRC)	N/A	(800) 424-8802
USEPA Spill Response Hotline	USEPA (Region I)	(617) 223-7265
RIDEM spill response contact	Rhode Island	(800) 498-1336 (401) 277-2284
Police	NETC Portsmouth State	(401) 841-3241 (401) 683-0300 (401) 849-4444
Fire	NETC Portsmouth	(401) 841-3333 (401) 683-1155
Hospital	Newport Hospital	(401) 845-1640
Ambulance	Newport Fire Department	(401) 846-2211
Grey Coppi (PHSM)	Foster Wheeler Environmental Corporation	(215) 702-4079
John Holwell (Project Manager)	Foster Wheeler Environmental Corporation	(617) 457-8234
Portsmouth Emergency Planning Committee	N/A	(401) 683-5510
State Emergency Response Commission (SERC)	N/A	(401) 277-3039
Emergency Line (Security)	NETC	(401) 841-3456
Dave Dorocz (ROICC)	Navy	(401) 841-3735 or (401) 841-1764
Response Contractor	Clean Harbors	(401) 461-1300
Captain of The Port (COTP)	U.S. Coast Guard, Providence	(401) 421-4291

The following information shall be posted at various, conspicuous locations throughout the site:

1. Emergency telephone numbers;
2. Diagrams showing the location of fire extinguishers and emergency equipment; and,
3. Emergency exit, evacuation routes and staging area.

4.6 Compliance With Other Regulations

This SPCC Plan has been prepared in accordance with 40 CFR Part 112 of the USEPA Oil Pollution Prevention Regulations. In accordance with Section 15 of the Rhode Island Oil Pollution Prevention Control Rules and Regulations, January 3, 1992, this SPCC Plan "may be substituted for the plan required by this section (Section 15)" by inclusion of the following information:

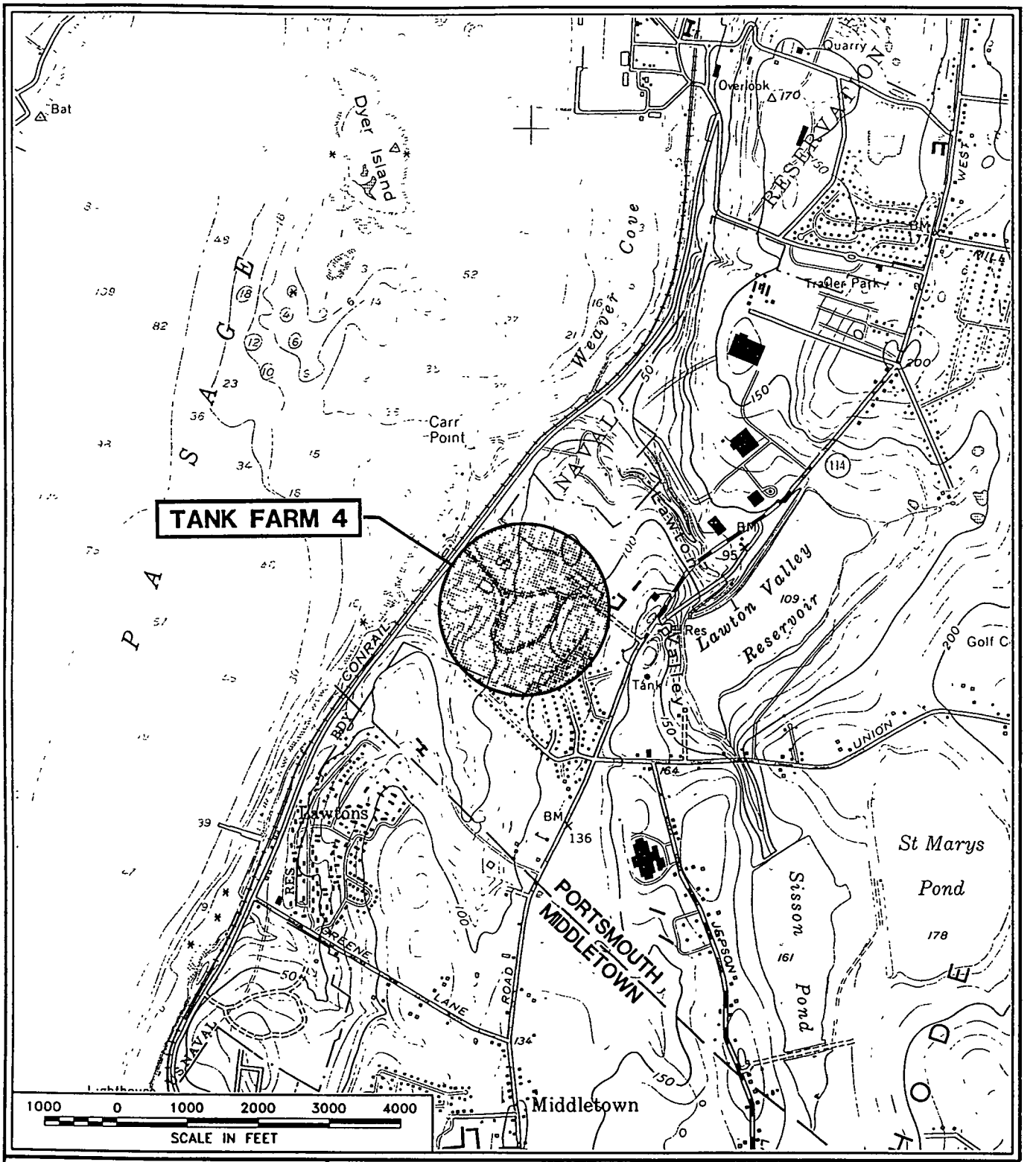
1. Up-to-date schematic diagram showing the location of all outdoor tanks and piping used for the storage and conveyance of oil, including the location of all emergency shutoff valves (see Figure 2-2 and Figure 2-4);
2. A description of on-site emergency containment and cleanup equipment (see Section 4.2);
3. Description of off-site auxiliary emergency equipment that can be readily obtained, including a list of cleanup contractors to contact for such equipment (see Section 4.3 and Appendix C);
4. Emergency telephone numbers of local, state and federal officials who should be contacted in case of a spill (see Section 4.5).

Table 2-1
OIL STORAGE

Tank/Container	Storage Capacity (gals)	Secondary Containment	Contents	Description of Use
Bulk Aboveground Storage				
Frac Tanks (6)	120,000	Double-walled steel	Residual oil (No. 2 and No. 6 oil)	Temporary storage from UST cleaning
Temporary Fueling Tank	1,000	Earthen berm	Diesel (No. 2) oil	Equipment fueling
Mobile Storage				
Tank Truck	5,000	N/A	No. 2 oil	Additive to USTs for pumping
Vac Trucks [1]	5,000	N/A	Residual oil	Transfer of oil off-site from frac tanks
Other Storage				
Drums (88) [2]	4,840	Earthen berm	Degreasing solvent	Tank cleaning activities
Drums (2) [2]	10	Earthen berm	Hydraulic oil	Operation of pumps
Drums (1) [2]	55	Berm	Residual oil	WTP operation
Drums (2) [2]	10	Metal cabinet	Gasoline	Fuel for equipment
Oil/Water Separators (3)	100 gal./min.	Berm	Residual oil	WTP operations
Transformer (500 kVA)	unknown	Concrete curb	Transformer oil	Power for WTP operations
Transformer (75 kVA)	unknown	none	Transformer oil	Power for office trailers
Bulk Underground Storage [3]				
Tank 37	2.65 million	N/A	Oil, water, and sludge	
Tank 38	2.65 million	N/A	Oil, water, and sludge	
Tank 39	2.65 million	N/A	Oil, water, and sludge	
Tank 40	2.65 million	N/A	Oil, water, and sludge	
Tank 41	2.65 million	N/A	Oil, water, and sludge	
Tank 42	2.65 million	N/A	Water	Closed
Tank 43	2 65 million	N/A	Oil, water, and sludge	
Tank 44	2 65 million	N/A	Oil, water, and sludge	
Tank 45	2.65 million	N/A	Oil, water, and sludge	
Tank 46	2.65 million	N/A	Oil, water, and sludge	
Tank 47	2 65 million	N/A	Oil, water, and sludge	
Tank 48	2.65 million	N/A	Oil, water, and sludge	
TOTAL STORAGE	135,915			

Notes: 1 - Number of vac trucks on site at one time varies depending on number of USTs being cleaned.
2 - Estimated number of drums on site at one time indicated in ( ) but could vary during facility operations
3 - Bulk Underground Storage for the 12 USTs provided for reference only. Storage not included in Total Storage.

FILE No. P\NORDIV\DO#13\WORKPLAN\[SPCCTBL1 XLS]Oil Storage



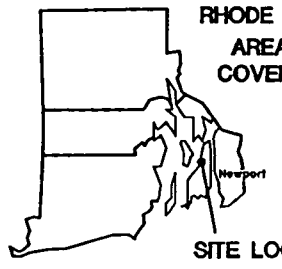


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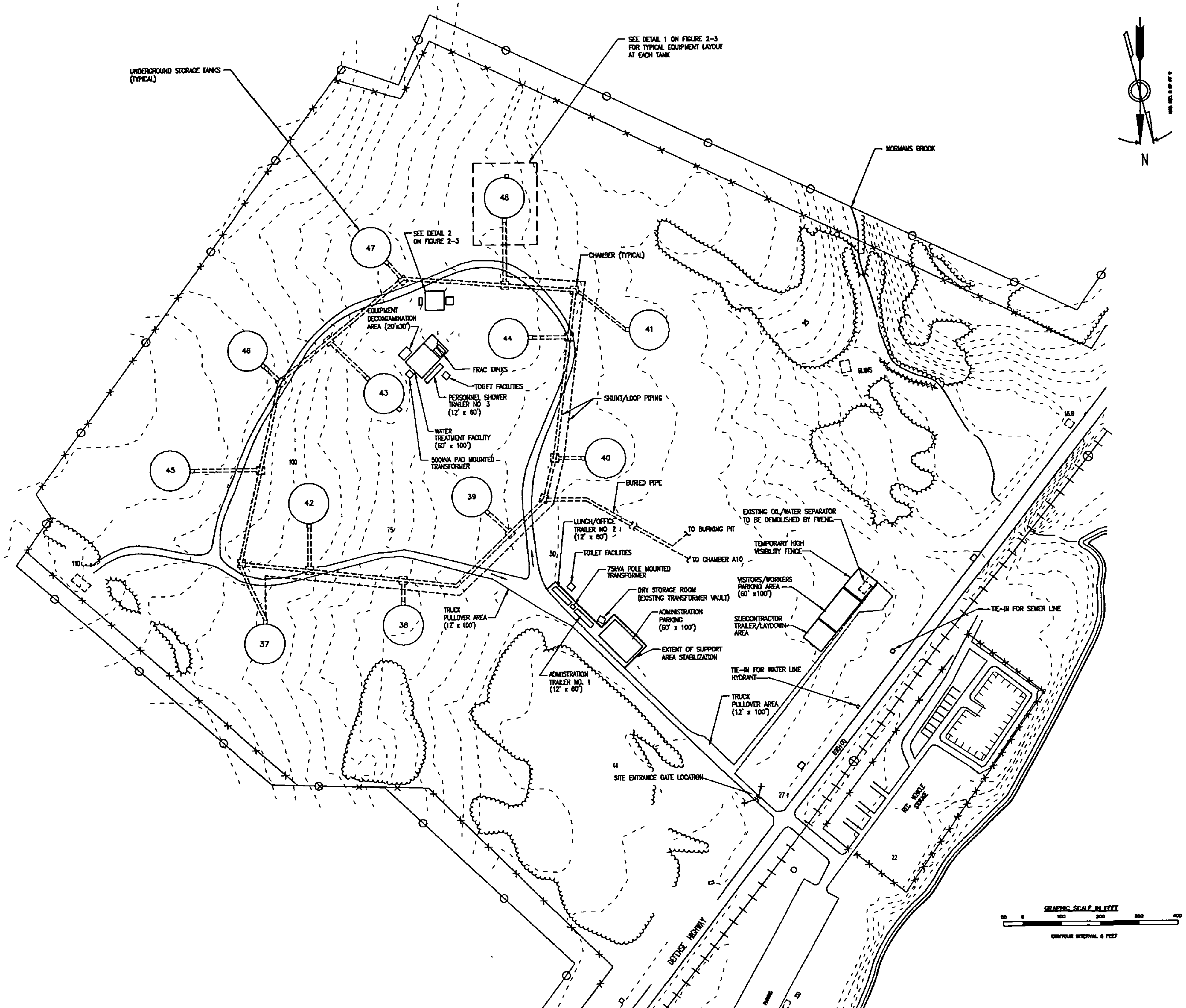
FIGURE 2-1

Naval Education and Training Center
Newport, Rhode Island

SITE LOCATION MAP

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE:1284FG11 DWG



LEGEND

- BUILDING OR STRUCTURE
- ROAD OR PAVED AREA
- TRAIL OR EARTH ROAD
- PROPERTY BOUNDARY & FENCE LINE
- FENCE
- NAVY PROPERTY BOUNDARY LINE
- RESERVATION BOUNDARY
- RAILROAD
- STREAM
- SHORE LINE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- DEPRESSION CONTOUR
- 14. SPOT GRADE ELEVATION ON SPOT
- WOODED AREA
- MARSH LAND

NOTES

1. LOCATION OF EQUIPMENT MAY BE FIELD ADJUSTED AS NECESSARY
2. GRAVEL ACCESS ROAD WILL BE LOCATED IN THE FIELD

PREPARED BY,

FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE, BOSTON, MASSACHUSETTS 02210

BASE MAP DERIVED FROM,

MELVILLE SOUTH, EXISTING CONDITIONS MAP, NETC DWG. 31062-307 DATED 4/95, FROM THE DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND, EDUCATION AND TRAINING CENTER, NEWPORT, RHODE ISLAND

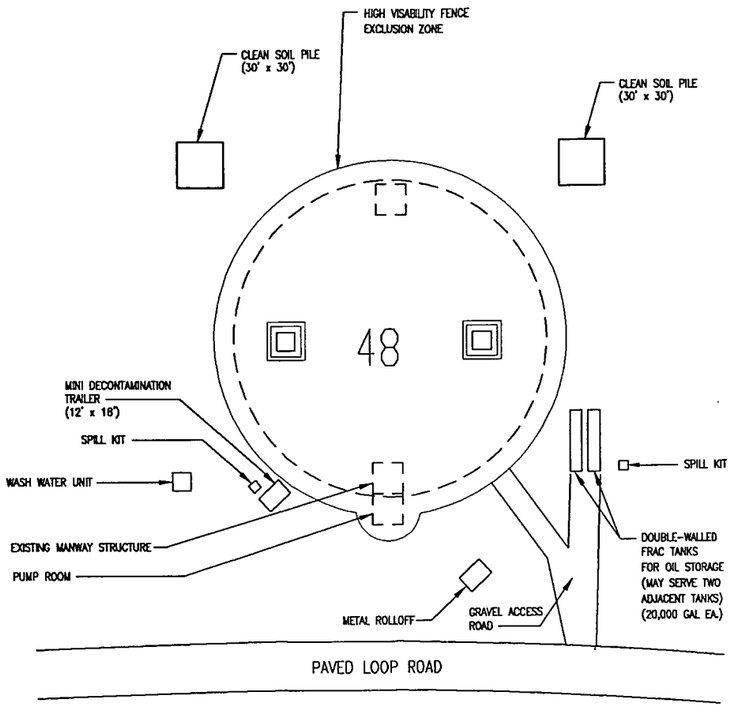
FIGURE 2-2

Naval Education and Training Center
Newport, Rhode Island

TANK FARM 4 SPCC PLAN
SITE LAYOUT PLAN

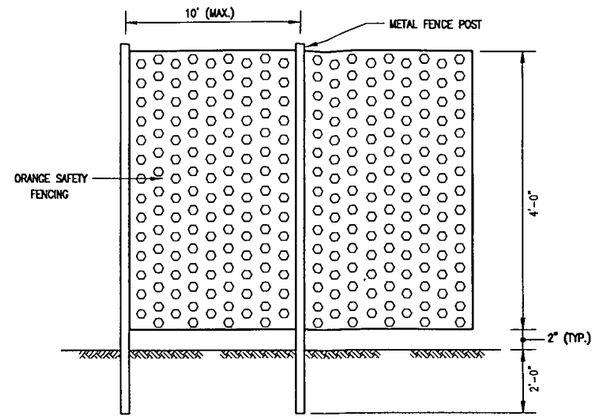
SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

SPCC-2-2 DWG
4/19/96



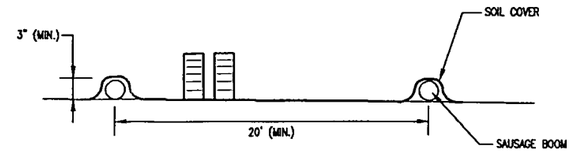
TYPICAL EQUIPMENT LAYOUT
AT EACH TANK LOCATION

NOT TO SCALE



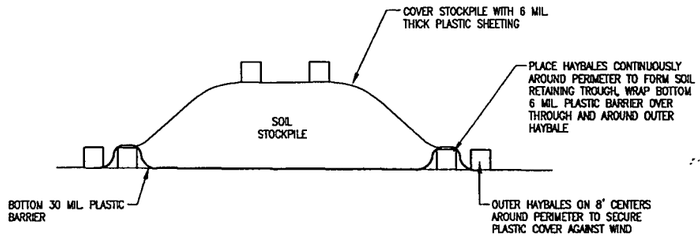
SAFETY FENCE DETAIL

NOT TO SCALE



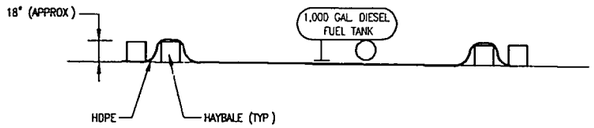
DRUM STORAGE AREA DETAIL

NOT TO SCALE



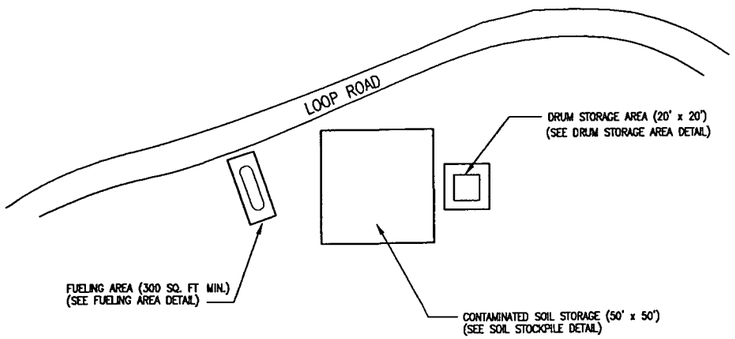
TYPICAL SOIL STOCKPILE
(PETROLEUM IMPACTED SOIL)

NOT TO SCALE



FUELING AREA DETAIL

NOT TO SCALE



DRUM STORAGE & FUELING AREAS

NOT TO SCALE

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FIGURE 2-3

Naval Education and Training Center
Newport, Rhode Island

TANK FARM 4 SPCC PLAN DETAILS

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

SPCC-2-4 DWG
4/19/96

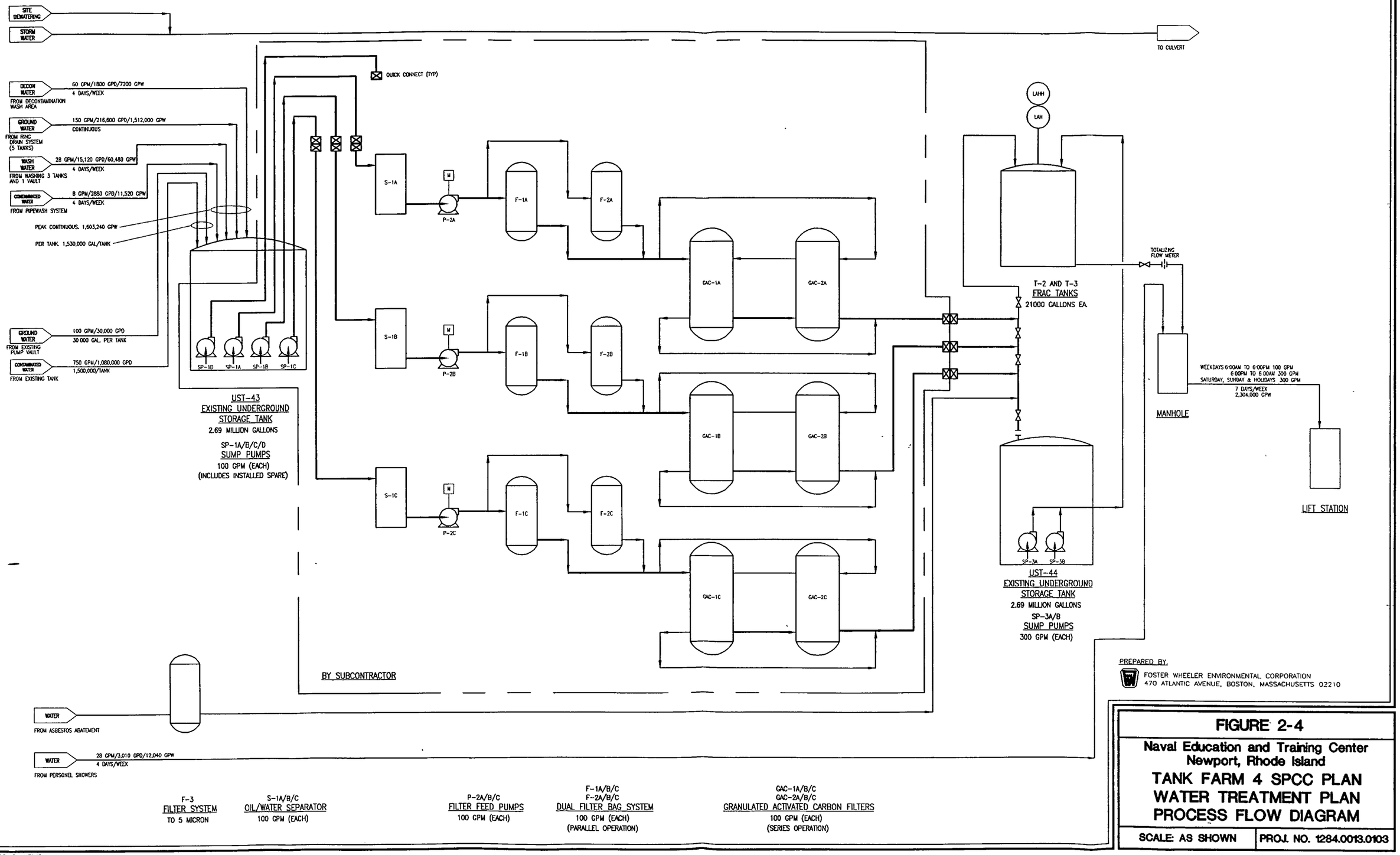

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FIGURE 2-4

Naval Education and Training Center
Newport, Rhode Island

TANK FARM 4 SPCC PLAN
WATER TREATMENT PLAN
PROCESS FLOW DIAGRAM

SCALE: AS SHOWN | PROJ. NO. 1284.0013.0103

SPCC-2-4.DWG
4/19/96

Appendix A

Secondary Containment Volume Calculations

FOSTER WHEELER ENVIRONMENTAL CORPORATION

BY RMD DATE 4/19/96 SHEET 1 OF 2

CHKD BY EPG DATE 4/19/96 OFS NO. _____ DEPT NO. _____

CLIENT NAVY NORTH DIV

PROJECT DO# 13, NETC - Newport, Tank Farm 4

SUBJECT SPCC - Secondary Containment Volume Calculations

I DRUM STORAGE AREA
- used to store 55-gallon drums of degreasing solvent

1. Largest Single Container = 55 gallons

2. Required Secondary Containment = 55 x 110%

= 60.5 gallons

3. Secondary Containment Volume (Existing):

Storage area: 20 ft x 20 ft = 400 ft²

Berm height: 3" (min) = 0.25 ft.

Volume: (400 ft² x 0.25 ft) x 7.48 gal/ft³

= 748 gallons > 60.5 gallons ∴ OK

II FUELING AREA
- used to store Diesel Fuel tank

1. Largest single container = 1,000 gallons

2. Required Secondary Containment = 1,000 x 110%

= 1,100 gallons

FOSTER WHEELER ENVIRONMENTAL CORPORATION

BY RMD DATE 4/9/96 SHEET 2 OF 2

CHKD. BY EPG DATE 4/12/96 OFS NO _____ DEPT NO _____

CLIENT NAVY NORTHDIV

PROJECT DO #13, NETC - Newport, Tank Farm 4

SUBJECT SPCC Secondary Containment Volume Calculations

3. Secondary Containment Volume (Existing):

Storage Area: 300 ft^2 (min)

Berm height: 6" (min) = 0.5 ft

Volume: (300 ft^2 x 0.5 ft) x 7.48 gal/ft^3

= 1,122 gallons > 1,100 gallons ∴ OK

Appendix B

EPA Memorandum Dated April 29, 1992

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 29 1992

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Use of Alternative Secondary Containment Measures at Facilities Regulated under the Oil Pollution Prevention Regulation (40 CFR Part 112)

FROM: Don R. Clay
Assistant Administrator

TO: Director, Environmental Services Division
Regions I, VI, VII
Director, Emergency and Remedial Response Division
Region II
Director, Hazardous Waste Management Division
Regions III, IX
Director, Waste Management Division
Regions IV, V, VIII
Director, Hazardous Waste Division
Region X

PURPOSE

This memorandum addresses the U.S. Environmental Protection Ag ncy's (EPA) interpretation of the term "secondary containment" as it is used in section 112.7(c) of the Oil Pollution Prevention r gulation (40 CFR Part 112), also known as the Spill Prevention, Control and Countermeasures (SPCC) regulation. It also addresses technologies that may be used to provide secondary containment for smaller, shop-fabricated aboveground storage tanks (ASTs) consistent with 40 CFR Part 112.7(c).

BACKGROUND

Since 1973, the SPCC regulation has included the following provision addressing secondary containment and the allowance for quivalent preventive systems. Section 112.7(c) states:

> Appropriate containment and/or diversionary structures or equipment to prevent discharged oil from reaching a navigable water course should be provided. One of the following preventive systems or its equivalent hould be

used as a minimum: (1) Onshore facilities: (i) Dikes, berms or retaining walls sufficiently impervious to contain spilled oil; (ii) Curbing; (iii) Culverting, gutters or other drainage systems; (iv) Weirs, booms or other barriers; (v) Spill diversion ponds; (vi) Retention ponds; (vii) Sorbent materials.

The SPCC regulation implements Section 311(j)(1)(C) of the Clean Water Act (CWA) for non-transportation-related faciliti s. In 1988, the Agency published regulations at 40 CFR Part 280 for underground storage tanks (USTs) implementing the requirements f Subtitle I of the Resource Conservation and Recovery Act. An apparent result of the implementation of the UST regulation is a trend of facilities replacing USTs with ASTs.

In response to this trend, tank manufacturers have developed various new designs for shop-fabricated AST systems. Alternative AST systems for which we have information generally do not exceed 12,000 gallons capacity. Some of these new designs include a steel or reinforced concrete secondary shell fully encasing a storage tank; others include an attached, shop-fabricated c ntainment dike. Many other system designs may also be available. Typically, these alternative AST system designs provide containment for the entire capacity of the inner tank f r spills resulting from leaks or ruptures of the inner tank.

In 1988, EPA noted in its Oil SPCC Program Task Force Report that the Agency has limited inspection resources to implement th SPCC program. Less than 1,000 of the estimated half million SPCC-regulated facilities are inspected by EPA annually. Moreover, section 311 of the CWA does not permit EPA to delegate this program to the States. The Task Force, therefore, r commended that EPA attempt to target these very limited resources to inspecting the highest-risk facilities. In general, we believe that facilities using smaller-volume AST systems generally pose less risk than larger field-erected tanks and tank farms of large uncontrolled spills reaching navigable waters, especially if these facilities are not located near sensitiv ecosystems or water supply intakes.

The traditional method of providing secondary containment for ASTs has been to construct dikes, berms, retaining walls and/or diversion ponds to collect oil once it spills. Based on the experience of EPA Regional personnel implementing the SPCC regulation since 1973, those traditional means of secondary containment are very effective and reliable methods of protecting the surface waters from oil spills from ASTs. However, the SPCC regulation is a performance-based regulation that permits facility owners or operators to substitute alternative forms of spill containment if they provide protection against discharg s t navigable waters substantially equivalent to that provided by the systems listed in section 112.7(c).

Consistent with section 112.1(e) of the SPCC regulation, this memorandum does not supersede the authority of "existing laws, regulations, rules, standards, policies and procedures pertaining to safety standards, fire prevention and pollution rul s," including fire codes or other standards for good engineering practice that may apply to alternative AST systems.

On October 22, 1991, EPA proposed revisions to the SPCC r gulation. The proposed revisions do not affect the provisions of section 112.7(c) that describe alternative systems that are substantially equivalent to those specifically listed in paragraphs (c)(1)(i) through (c)(1)(vii).

OBJECTIVE

This memorandum should allow EPA Regional personnel to provide consistent interpretation of the secondary containment provisions of section 112.7(c) of the SPCC regulation to facilities with generally smaller shop-fabricated ASTs. Alt rnative AST systems, including equipment and procedures t pr v nt reasonably expected discharges, should satisfy the sec ndary containment provisions of the SPCC regulation under most site-specific conditions.

DISCUSSION

As smaller shop-fabricated ASTs are increasingly appearing in the market, we have observed a number of innovative technologies to reduce the risks of both leaks and spills. Mor over, these smaller shop-fabricated tanks do not pose the same risk of large uncontrolled oil spills to navigable waters as the larger field-erected tanks. Therefore, we believe that th re should be many situations in which protection of navigable waters substantially equivalent to that provided by the secondary containment systems listed in section 112.7(c) could be provided by alternative AST systems that have capacities generally less than 12,000 gallons and are installed and operated with protective measures other than secondary containment dikes. For example, some State programs provide an exemption from State spill prevention requirements for ASTs with similar capacities. However, in certain situations, these alternative AST systems might appropriately not be presumed to comply with the provisions of section 112.7(c). An example of this type of situation is facilities containing four or more ASTs or ASTs with combined capacity greater than 40,000 gallons, where a number of larger tanks are connected by manifolds or other piping arrangements

that would permit a volume of oil greater than the capacity of one tank to be spilled as a result of a single system failure.[1]

The owner or operator of any facility subject to the SPCC regulation, including facilities using alternative AST systems, must adhere to all applicable provisions of the SPCC regulation. Th owner or operator of each regulated facility must develop a site-specific SPCC Plan that must be certified by a Registered Professional Engineer as required by section 112.3 of the regulation. Pursuant to the requirement of section 112.7 that the SPCC Plan shall "include a discussion of the facility's conformance with the appropriate guidelines listed," a complete SPCC Plan for any facility using alternative AST systems should include a discussion of why the facility is considered to be in conformance with section 112.7(c).

In evaluating these shop-fabricated AST systems, EPA's Office of Solid Waste and Emergency Response (OSWER) has looked at requirements the Agency has established for tanks in situations where traditional secondary containment systems cannot be provided (e.g., USTs covered by 40 CFR Part 280). Additionally, OSWER has evaluated relevant State and local government requirements. OSWER also has considered factors related to alternative AST systems, including tank size, typical pumping rates used to fill and empty them, and the lower risk of large, uncontrolled oil spills from facilities using such AST systems, based on tank size, design, and pumping rates. We believe that for these smaller shop-fabricated ASTs some alt rnative AST systems that include adequate technical spill and leak prevention options such as overfill alarms, flow shutoff r r strictor devices, and constant monitoring of product transfers generally would allow owners and operators of facilities to provide protection of navigable waters substantially equivalent to that provided by secondary containment as defined in 40 CFR Part 112.7(c). For example, small double walled ASTs, when used with equipment and procedures described in this guidance, generally would provide substantially equivalent protection of navigable waters under section 112.7(c) of the SPCC regulation wh n the inner tank is an Underwriters' Laboratory-listed ste l tank, the outer wall is constructed in accordance with nationally accepted industry standards (e.g., those codified by the American Petroleum Institute, the Steel Tank Institute, and American Concrete Institute), the tank has overfill prevention measures that include an overfill alarm and an automatic flow restrictor

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[1] This is based on similar capacities in proposed National Fire Protection Association standards and consideration of the risks to public health or welfare or the environment of spills of potentially larger size.

or flow shut-off,[2] and all product transfers are constantly monitored.[3]

CONCLUSION

When the only significant source of potential oil spills to navigable waters of the United States from a facility is from alternative ASTs as described in this memorandum, an SPCC Plan that is certified by a Registered Professional Engineer and that requires equipment and operating practices in accordance with good engineering practice and the principle of substantial equivalence as described above should be presumed to achieve the protection of navigable waters substantially equivalent to that provided by the preventive systems specified in 40 CFR Part 112.7(c).

cc: Bowdoin Train
Henry Longest
Bruce Diamond
Deborah Dietrich
Walter Kovalick
James Makris
Charles Openchowski
David Ziegele
Wendy Butler
Removal Managers, Regions I-X

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[2] Consistent with the performance standards for these devices as described in section 280.20(c) of EPA regulations for USTs at 40 CFR Part 280 and in an August 5, 1991, amendment, an automatic flow shut-off will shut off flow so that none of the fittings located on top of the tank are xposed to product as a result of overfilling, an automatic flow restrictor will restrict flow 30 minutes prior to overfill or when the tank is no more than 90 percent full, and a high level alarm will alert the operator one minute before overfilling or when the tank is no more than 90 percent full.

[3] Consistent with the performance standard for overfill control as described in section 280.30(a) of EPA regulations for USTs at 40 CFR Part 280, an owner/operator of the facility will ensure that the transfer operation is monitored c nstantly to prevent overfilling and spilling.

Appendix C

Off-Site Auxiliary Emergency Equipment Provided by Clean Harbors

Equipment

One 5,000-gallon Stainless Steel Vacuum Trailer
One 6,000-gallon Carbon Steel Vacuum Trailer
Two Tractors with Wet Systems
One 3,200-gallon Stainless Steel Vacuum Straight
One 22-foot 10 Wheel Box Truck (40 55-gallon drum capacity)
One 10-Wheel Dump Truck (12 yd. water level capacity with tag along trailer)
One Caterpillar 4WD Backhoe model #436
Two Hollow Stem Auger Drill Rigs
One 6-Wheel Utility Rack Truck
One 18-foot Workboat with 35 HP outboard
One 16-foot Workboat with 15 HP outboard
One 14-foot Workboat with 15 HP outboard
One Spill Response Trailer containing:

- 1,400 feet of 24-inch Harbor Boom
- 14-foot Workboat with 15 HP outboard
- assorted sorbent material
- 600-foot coil of rope
- assorted related work equipment

Two 185 CFM Compressors
One Utility Trailer
500 feet of 18-inch Harbor Boom
One 6-inch Gas Powered Floating Skimmer
One 3-inch Non-Mechanized Floating Skimmer
One 3-inch Lister Powered Product Pump capacity 300+ GPM
One 3-inch Air Driven Double Diaphragm Aluminum capacity 200+ GPM
Three 2-inch Air Driven Double Diaphragm Aluminum (2 poly., 1 alum.) capacity 100+ GPM
Two 1-inch Air Driven Double Diaphragm Aluminum capacity 40+ GPM
Six ICOM Hand Held Marine Radios
Two Standard/Horizon Hand Held Marine Radios
One Ray/Jefferson Hand Held Marine Radio
One Tandy Hand Held Marine Radio
Four Stearns Survival Suits

Appendix B

Waste Management Plan (WMP)

US NAVY NORTHERN DIVISION
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-94-D-0398
DELIVERY ORDER NO. 0013

WASTE MANAGEMENT PLAN

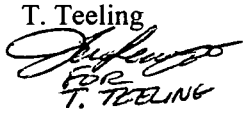
TANK FARM NO. 4 REMEDIAL ACTIONS
NAVAL EDUCATION AND TRAINING CENTER (NETC)
NEWPORT, RHODE ISLAND

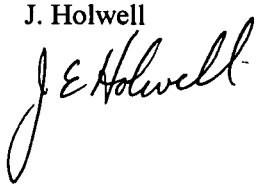
April 1996

Prepared by

Foster Wheeler Environmental Corporation
470 Atlantic Avenue
Boston, MA 02210

Revision	Date	Prepared By	Approved By	Pages Affected
1	5/20/96	T. Teeling	J. Holwell	1,10





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1.0 INTRODUCTION

1.1 Project Background

The Naval Education Training Center (NETC-Newport) Tank Farm No. 4 is a 90-acre site located in the Town of Portsmouth, Rhode Island as shown in Figure 1-1. The tank farm contains 12 large underground storage tanks (USTs) which were used primarily to store No. 6 fuel oil. For a brief period, several USTs were used for storing No. 2 fuel oil. The storage tanks were in operation until the late 1970s. In 1992, the State of Rhode Island revised the "Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Materials" to include those USTs storing fuel oil. Consequently, the tanks at Tank Farm No. 4 became subject to relevant closure requirements. Following enactment of the new UST regulations, the Navy initiated the process for permanent closure of the tanks.

On behalf of the Navy, Halliburton NUS Corporation (HNUS) completed a Preliminary Closure Assessment of the Tank Farms No. 4 and 5 in June 1995. Subsequently, OHM Remedial Services Corporation closed Tank Farm No. 5 completely and initiated closure of UST No. 42 in Tank Farm No. 4. Presently, Rhode Island Department of Environmental Management (RIDEM) has not approved closure of UST No. 42 since the associated pump has not yet been closed. Brown and Root Environmental, a division of HNUS, conducted an assessment of the closure of UST No. 42 and submitted a final Tank No. 42 closure Assessment Report dated December 1995.

Under Remedial Action Contract No. N64272-94-0398 Delivery Order No. 0013, Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) was selected as the Contractor to complete the closure of UST No. 42 and the remaining 11 USTs in Tank Farm No. 4. Closure activities will include removal and disposal of UST contents, pumping, cleaning, and equipment removal, followed by UST cleaning. Activities will also involve removal and disposal of associated "shunt and loop" piping and the removal of a concrete oil/water separator. Foster Wheeler Environmental is required to conduct such activities according to the above mentioned regulations. A final tank closure assessment report will be submitted to RIDEM for each UST completed when all activities have been completed.

1.2 Project Objective

This Waste Management Plan (WMP) has been prepared for UST closure and soil remediation activities being conducted at Tank Farm No. 4 located at NETC-Newport. The primary objective of this WMP is the safe handling and proper on-site management, treatment, transportation, and disposal of wastes generated during project activities. This objective will be achieved through compliance with local, state, and federal regulations, and the requirements of this plan. The WMP identifies waste streams and details the waste management responsibilities of Contractor personnel. The WMP also describes the equipment and waste management practices that will be implemented for sampling, analyzing, classifying, segregating, accumulating, storing, treating, packaging, transporting, and disposing of the generated wastes.

2.0 ORGANIZATION AND RESPONSIBILITIES

This section describes the organization and responsibilities of the personnel involved in the management of project derived waste. Every person engaged in the design, planning, or execution of this environmental restoration project has a responsibility to minimize the amount of waste generated and to handle the generated waste in strict accordance with applicable regulations, contract, and this plan.

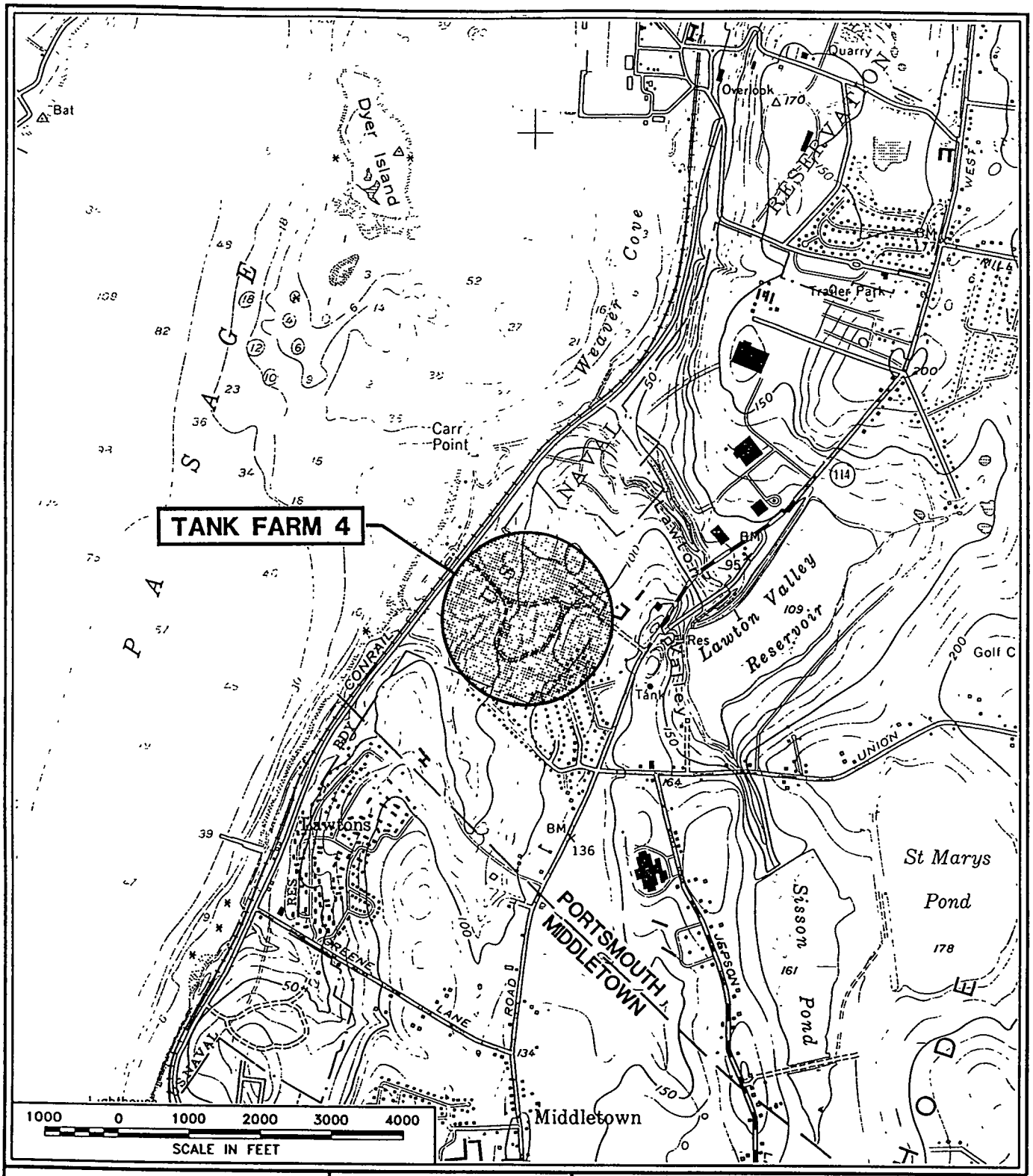

FIGURE 2-1

Naval Education and Training Center
Newport, Rhode Island

SITE LOCATION MAP

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE:1284FG11.DWG

2.1 Organization and Responsibilities

The project organization is presented in the project Work Plan. The Regulatory Specialist will provide support and oversight for project personnel engaged in waste management activities. The key elements of responsibilities for project management are: characterization sampling and waste classification, segregation, on-site storage, handling, and treatment; container selection and packaging, labeling, and marking; and waste profiling, manifesting, transportation, tracking, and reporting. The focus of the project team site personnel will be to perform the above activities according to applicable federal, state, and local requirements. The legally defensible classification of each waste stream will define the storage, transportation, and disposal requirements that are applicable.

Project personnel involved in waste management activities will receive the RCRA and US Department of Transportation (DOT) training required by the US Environmental Protection Agency (EPA) and DOT for the management and transportation of RCRA hazardous wastes and DOT hazardous materials. These training programs are designed to teach personnel to perform their duties in compliance with applicable EPA and DOT requirements.

The responsibilities of each member of the project team is presented below.

2.1.1 Regulatory Specialist

For the purposes of this project, the responsibilities of the Regulatory Specialist will be fulfilled by Mr. Michael Zizza, Project Engineer. He will be supported by Regulatory Specialists located in the Foster Wheeler Environmental Langhorne, Pennsylvania and Boston, Massachusetts offices. Mr. Zizza is responsible for implementation of this WMP. He has received training as required by 49 CFR Part 172, Subpart H in requirements for transporting hazardous materials, and 40 CFR 265.15 for generators managing hazardous waste, and all applicable Occupational Safety and Health Administration (OSHA) requirements, and will coordinate RCRA and DOT training for site employees involved in waste management activities. Mr. Zizza will be responsible for ensuring legally defensible testing and classification of wastes generated during this project, and will also develop the disposal instructions for each waste stream and assure that waste storage, treatment, transportation, and disposal activities are in full accordance with applicable local, state, and federal regulations, Navy requirements, and the disposal facility requirements. The Regulatory Specialist will review all manifest packages prior to submittal to the Resident Officer in Charge of Construction (ROICC) and prepare all information required for annual reports.

2.1.2 Project Manager

The Project Manager, Mr. John Holwell, is responsible for project communications and management, scheduling and planning, and organizing the work in a manner that minimizes the generation of project derived waste, and for assuring that the work is carried out in accordance with the WMP, and for alerting the Regulatory Specialist(s) to any unforeseen or unplanned waste generation or waste management activity.

2.1.3 Site Manager

The Site Manager, Mr. Jon Cary, is responsible for managing and directing all on-site activities including the supervision of direct labor and subcontractors involved in waste management activities, interfacing with the Navy ROICC, and ensuring compliance with the WMP and contract requirements. Mr. Cary is responsible for the management and execution of this plan.

2.1.4 Site Superintendent

The Site Superintendent (to be determined) will support the Site Manager during major phases of the project by overseeing craft workers, equipment operators, and the various aspects of the tank farm closure and disposal of materials and wastes.

2.1.5 Other Field Personnel

All other field personnel are responsible for conducting the work in accordance with this plan as directed by the above persons. Any instance in which the plan is not followed or where there is a potential for contaminated materials to be released to the environment shall be immediately reported to one of the above persons.

2.1.6 Navy Resident Officer in Charge of Construction

The Navy Resident Officer in Charge of Construction (ROICC) will review all submittals designated for Navy approval. Submittals include waste analysis and classifications, waste profile/approval forms, Land Disposal Restriction (LDR) certifications, manifests/shipping papers, and manifest discrepancy and exception reports. After submittals have been approved by the ROICC, no re-submittals will be given consideration unless accompanied by a written justification as to why a change is necessary.

2.2 Waste Definitions

In order to determine the proper handling, storage, and disposal requirements for waste, the waste must first be classified in accordance with all applicable federal, state, and local regulations. Sampling will be conducted during the project to ensure that all wastes are properly characterized prior to disposal. Sampling procedures are provided in the Sampling Analysis Plan (SAP). The final classification of each waste stream will be determined by the Navy after the receipt of the results of the RCRA characteristic and TCLP analyses.

2.2.1 Hazardous Waste

A RCRA determination will be made to determine if the material is a RCRA hazardous waste (40 CFR 261.11). RCRA regulations define hazardous waste as (1) a listed waste under 40 CFR 261..31,.32, and .33 , or (2) characteristic for ignitability, corrosivity, reactivity, or toxicity as defined in 40 CFR 261.21, .22, .23, and .24.

2.2.2 Listed Hazardous Waste

Based upon site history and past operations, the presence of listed hazardous wastes is not anticipated at Tank Farm No. 4. Petroleum fuel oils are not as "U" or "P" listed RCRA wastes under 40 CFR 261.33, , and the petroleum storage operations do not meet the definition of any of the RCRA "F" or "K" listed waste generating processes listed in 40 CFR 261.31 and 261.32. Any site wastes regulated as RCRA wastes would be regulated solely because the waste exhibits a RCRA characteristic.

2.2.3 Characteristic Hazardous Waste

A solid waste is a characteristic hazardous waste if it exhibits any of the following characteristics:

- Ignitability (D001)
- Corrosivity (D002)
- Reactivity (D003)
- Toxicity (D004-D043)

The full definition of these characteristics is provided in 40 CFR Part 261.21-.24.

Based on past analytical data from similar wastes generated during tank closure activities at Tank Farm No. 5, RCRA reactive (D003), or corrosive (D002) wastes are not anticipated to be present, however oil and/or oil sludge may exhibit RCRA Ignitability due to its flash point or RCRA Toxicity based upon the presence of RCRA metals above TCLP regulatory levels. Based upon the presence of RCRA characteristic metals and/or organic compounds in some Tank Farm No. 5 tank bottom sludges, it is assumed that approximately 25% of the Tank Farm No. 4 tank bottom sludges may be RCRA characteristically hazardous for heavy metals and/or organics. Tank bottoms sludges will be sampled and analyzed for RCRA ignitability and by TCLP to identify any RCRA characteristics prior to selection an off-site disposal facility.

2.3 Land Disposal Restrictions

The Land Disposal Restrictions (LDRs) prohibit placement of hazardous wastes on or in the land, except in an EPA approved corrective action management unit. The LDRs specify treatment technologies and treatment standards for RCRA hazardous wastes. The Regulatory Specialist will identify LDRs for site generated RCRA wastes and will prepare Generator Land Disposal Restricted Waste Notification and Certification forms required for all off-site hazardous waste shipments. The Notification and Certification forms will be provided to the Navy ROICC for review and signature prior to off-site waste shipments.

2.4 TSCA Waste

Wastes containing polychlorinated biphenyls (PCBs) greater than 50 ppm and Asbestos Containing Material (ACM) are regulated for disposal under the Toxic Substances Control Act (TSCA). Since PCBs are not normally found to be present in virgin fuel oils, they are not expected to be found in oils and oil sludges at Tank Farm No. 4. ACM is regulated for disposal under TSCA. All ACM waste generated during steam pipe asbestos abatement activities will be disposed of off-site by the Asbestos Abatement subcontractor at permitted landfills approved by Foster Wheeler Environmental and the Navy.

2.5 Solid Waste

Solid waste are those materials defined by 40 CFR 262.1 as drilling wastes, garbage, refuse, sludge, and other discarded material including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, and agricultural operation and from community activities. Site generated solid wastes which do not exhibit any RCRA characteristics are regulated as non-hazardous wastes and will be disposed of in permitted Subtitle D solid waste facilities. All Subtitle D solid wastes facilities to be used for site waste disposal will be submitted to the Navy ROICC for approval prior to off-site shipment.

2.6 Regulatory Requirements

2.6.1 Authorized Agencies

Since the wastes to be generated during project activities are anticipated to be both hazardous and non-hazardous waste, RIDEM will have authority over all waste management activities. Hazardous waste

and non-hazardous industrial wastes may be generated during the performance of the project. The following federal and state regulations are applicable to this activity: 40 CFR Parts 260-299; 49 CFR Parts 100-199; and Rhode Island DAHM-WMB-01-92.

2.6.2 Waste Management Permit/Approval Requirements

There are no permitting requirements for the off-site disposal of hazardous and non-hazardous wastes generated during closure of the Tank Farm No. 4 USTs. Foster Wheeler Environmental is responsible for obtaining disposal approvals from the off-site disposal facilities. The Navy is responsible for obtaining the POTW discharge permit for the on-site wastewater treatment plant which will be used to treat UST aqueous wastes, decontamination water, and groundwater.

2.7 On-Site Waste Management, Testing, and Classification

Remedial wastes will be generated during the remediation phases of the Tank Farm No. 4 tank closure. The steps that will be necessary to properly manage the wastes on-site according to all applicable federal, state, and local regulations are presented in the following sections: segregation/screening, containment, accumulation/storage, marking and labeling, sampling and classification, identification of TSDF, and logging and tracking.

2.7.1 Waste Handling Equipment

Waste handling equipment necessary to perform anticipated investigation and remediation activities will include:

- Caterpillar 325 excavator (or equivalent)
- Caterpillar loader (or equivalent)
- DOT approved vacuum tankers
- DOT approved dump trailers and roll-off containers
- Caterpillar 446 rubber-tired backhoe (or equivalent)
- Submersible pumps
- Centrifugal pumps
- Product recovery pumps
- Power washers/steam cleaning equipment
- Decontamination equipment
- Frac tanks
- Wastewater treatment plant
- Waste sampling equipment
- DOT Specification 1A1/1A2 steel drums
- Air compressor
- Air blowers

2.7.2 Waste Minimization

Waste minimization is a prime objective of the project team during the implementation of tank closure activities. The principal components of this program include:

- Incorporating waste minimization into all planning activities
- Segregation of waste streams

- Re-use/recycling of materials where possible
- Minimizing use of hazardous materials
- Do not contaminate materials unnecessarily
- Decontaminate and re-use equipment when practical
- Employ strict inventory control of hazardous materials
- Minimize the amount of environmental media generated using dedicated equipment to minimize decontamination requirements and decontamination wastes generated

Each of the above steps will reduce the amounts of contaminated wastes being generated. Site inspections will be conducted by both the Regulatory Specialist and the Quality Control System Manager (QCSM) to monitor site compliance and waste minimization activities.

2.7.3 Segregation/Screening

This section contains specific details on how the wastes from each activity will be segregated. These procedures will be closely followed in order to minimize the mixing of contaminated and uncontaminated materials. Waste will be segregated based upon the knowledge of the waste including its source, chemical composition, appearance, odor, field monitoring results, and laboratory analysis. Soil and water waste generated during sampling activities will be containerized separately. Waste from different samplings within the same area may be consolidated; however, waste from different areas will be containerized separately. Non-hazardous waste will be segregated from hazardous waste. The intent is to segregate waste into categories which are intended to facilitate waste classification, minimize treatment and disposal costs, and match the acceptance criteria of the disposal facilities.

2.7.4 Containerization

All waste streams will be evaluated prior to generation to determine the most cost-effective method of handling and storage. All containerized wastes will be stored in DOT specification containers. Bulk and non-bulk containers will be considered based on estimated volumes of waste to be generated. All waste destined for off-site disposal will be stored in DOT specification containers. This will eliminate the need to re-package for off-site shipment material.

DOT specification 1A1 (closed top) and 1A2 (open top) steel drums are suitable for the non-bulk waste streams such as non-pumpable oil sludges. Contaminated water generated during product removal and decontamination activities will be collected in UST No. 43 prior to treatment in the on-site WWTP. Treated wastewater will be collected in a large portable tank prior to discharge to the POTW. Bulk RCRA hazardous and non-hazardous solids (soils and debris) destined for off-site disposal will be placed into lined DOT approved dump trailers and roll-off containers. Liquid oils from USTs will be pumped into a portable storage tank prior to loading into DOT specification vacuum tankers for off-site transportation. All tanks and containers used for storage of fuel oils and sludges will meet requirements specified under NFPA-30 " 1990 Flammable and Combustible Liquids Code"

2.7.5 Accumulation/Storage

All containers and portable tanks will be staged at the secure accumulation areas specified in the Work Plan. These locations will be approved by the ROICC and will be used for the storage of all hazardous and non-hazardous waste generated by the closure activities. When test results are received, the Regulatory Specialist will initiate off-site disposal approvals and transportation services. Hazardous waste will be stored on-site for less than 90 days from the point of generation unless a generator storage limit extension is

obtained from RIDEM. The Regulatory Specialist will complete any requests for extension and submit them to the ROICC for review and signature prior to submittal to RIDEM for approval.

The Site Superintendent is responsible for identifying the emergency coordinator for the waste accumulation/storage area(s). The emergency coordinator is responsible for coordinating any emergency response activities related to waste storage area spills/releases. The following information will be posted at the accumulation area(s) at all times:

- Name/phone number of emergency coordinator
- Location of fire extinguisher and spill control materials
- Telephone number of the base fire department
- Signage "Authorized Personnel Only"

2.7.6 Container Inspections

Waste container accumulation areas will be inspected weekly by project personnel while the field work is in progress to ensure proper labeling and secure closure, and to assess the condition of each container, the number of containers, and the condition of the storage area. Any signs of deterioration, leaking, or dents will be noted and containers will be immediately overpacked, if necessary. Inspection results will documented in writing, and the date and time of inspection and the inspector's signature will be provided on each inspection log.

2.7.7 Container Marking and Labeling

At the time of generation, all waste containers will be marked in indelible ink, paint, or grease pencil with the following information:

- Source and location
- Contents of material in the container (type of material and expected hazards)
- Accumulation start date (the date the first drop of material was put in the container)
- Date container was sampled
- Special handling instructions
- HAZARDOUS WASTE label on known or suspected hazardous waste

Upon receipt of analytical results, containers will be immediately labeled with commercially available labels. Within five days of receiving analytical results, project personnel will contact the ROICC if the waste is determined to not be hazardous. After concurrence from the ROICC, the hazardous waste label will be removed and the container will then be relabeled with a NON-HAZARDOUS label. Based upon final classification, the Regulatory Specialist will select a DOT proper shipping name for any material meeting a DOT hazard class. The Regulatory Specialist will direct application of any required DOT markings and labels specific to the proper shipping name. The Regulatory Specialist will also specify required placarding based upon the proper shipping name selected. Completion of the EPA Hazardous Waste Label meets the DOT requirements for consignor/consignee, name, address, and contents.

2.7.8 Sampling and Waste Classification

A full sampling/analytical program, including analytical methods for constituents of concern, are outlined in the SAP. The classification of each waste stream will be based upon legally defensible analytical results from the waste characterization sampling. The Regulatory Specialist will submit the documentation

supporting each waste stream classification to the ROICC. The Navy ROICC will be responsible for approving all waste classifications.

2.8 Spill Prevention Procedures

The project personnel will take the necessary precautions to prevent the possible release of contaminants to the environment during all phases of the investigative and remedial action. Site personnel will follow the project SPCC plan which will be included as a part of the Environmental Protection Plan. In the event of a spill, the site personnel will perform the following at a minimum:

- Immediately notify the ROICC
- Notify the Regulatory Specialist, who will address federal and state requirements and Navy requirements for reportable spills
- Take immediate measures, utilizing properly protected personnel, to control and contain the spill
- Isolate the hazardous area and keep all unnecessary personnel out of the area
- Stay upwind and stay out of low areas
- Keep combustibles away from the spill materials
- Use water spray or other approved methods to reduced vapors, gases, and/or dust emissions

2.9 Manifest Packages

2.9.1 Contents

It is expected that both hazardous and non-hazardous waste will be generated during this project. Since the State of Rhode Island has its own Hazardous Waste Manifest, the Rhode Island manifest will be used unless the waste receiving state has its own manifest requirements. Non-hazardous waste will be shipped on a bill of lading or non-hazardous waste manifest. The principal components of the completed manifest package that will be submitted to the ROICC may include:

- Hazardous waste manifests
- Hazardous material shipping papers
- Waste profile sheets
- LDR notification and certification forms

Supporting information will contain:

- Waste disposal history
- Analytical results
- Material Safety Data Sheets
- Information reviewed in identifying the proper waste code
- DOT waste packaging, labeling, marking, manifesting, and placarding requirements

The Regulatory Specialist will prepare the complete manifest package including waste characterization, waste profiles/approvals, LDR certifications, and manifests/bills of lading.

2.9.2 Submittal

The Regulatory Specialist will submit to the ROICC for review and signature a reproducible copy of the complete manifest package for each individual waste stream as soon as possible after waste classification and disposal facility approvals have been obtained. The ROICC will be responsible for signing all hazardous waste manifests, Land Disposal Restricted Waste Notification/Certification forms, and bills of lading for off-site waste shipments. The Regulatory Specialist will hold the original complete manifest package and make corrections based on the ROICC's review, prior to off-site shipment.

Within 24 hours of the transporter signature and off-site shipment, the project personnel will provide the ROICC with two copies of the manifest (signed by the generator and the original transporter) and the remainder of the approved complete manifest package.

2.9.3 Approval

No waste will be transported prior to the approval of the complete manifest package and signature of the manifests and shipping documents by the NETC Environmental personnel.

2.10 Waste Transportation

The project team will oversee the transporters' activities prior to shipment of waste to ensure that the packaging, marking, labeling, handling, and placarding of waste complies with federal, state, and international regulations. The Regulatory Specialist will ensure that this information correlates with the waste classification and quantities generated and with the manifest and non-hazardous waste/bill of landing, as required.

2.11 Transportation and Disposal Reporting Requirements

2.11.1 Manifest Reporting Requirements

Under RIDEM regulations, two copies of each manifest must be sent to RIDEM. One copy of the Navy signed manifest will be submitted to RIDEM by Foster Wheeler Environmental within 24 hours after the waste is shipped off-site. The second copy will be sent to RIDEM by the TSDF after the TSDF facilities has signed the manifest.

2.11.2 Record Keeping Requirements

Records must be kept for all hazardous waste activities. Records to be retained include all hazardous waste manifests, Land Disposal Restricted Waste Notification forms, Generator Biennial Reports, manifest exception reports, bills of lading for non-hazardous waste shipments, and records of any test results, waste analyses, and waste profile sheets. Each generator signed manifest must be retained for three years or until the signed TSDF copy is received. The TSDF signed manifest copy must be kept for at least three years from the date the waste was accepted by the initial transporter. Copies of each Biennial Report and exception report must be kept for at least three years from the date the report was due. Finally, records of any test results, waste analyses, or waste determinations must be kept for at least three years from the date the waste was last sent to on- or off-site treatment, storage, or disposal.

The project team will provide all information necessary for the Navy to file the Biennial Report (EPA Form 8700-13A) by March 1 of each even numbered year. This information will be included in the Transportation and Disposal Closure Report for all hazardous waste transported and disposed of under this

contract. The information will be sufficient to comply with all federal and state laws and regulations. A cover letter will accompany the report to include the contract number, contractor name, project name, location of the project, report type, and date of submittal.

2.11.3 Transportation and Disposal Reporting Procedures

The project team will maintain records documenting all on-site treatment and off-site disposal shipments of site wastes. This information along with duplicate copies of all hazardous waste manifests Land Disposal Restricted Waste Notification Froms and Bills of Lading will be submitted as part of each Tank Closure Assessment Report.

11.4 Discrepancy Reports

Any discrepancies due to differences between the quantities or types of wastes designated on the manifest or shipping papers and the quantity or type of wastes a facility actually receives must be reported. Foster Wheeler Environmental will investigate these discrepancies, rectify the identified discrepancy, and report to the ROICC within 15 days after receipt of the waste by the disposal facility. This information will also be presented in each Tank Closure Assessment Report.

2.11.5 Exception Reports

On or before the 35th day after the transporter signs the manifest, it will be verified that the Navy has received a copy of the signed manifest from the TSDF. If the Navy has failed to receive a signed copy of the manifest by the 38th day, an exception report will be prepared. This exception report will be submitted to the ROICC for review and approval no later than day 40. Foster Wheeler Environmental will document all calls to locate shipments and submit the documentation with the exception report. The ROICC will submit the signed exception report to the EPA Regional Administrator prior to the 45th day. All exception reports will also be presented in each Tank Closure Assessment Report.

3.0 PROJECT WASTE STREAMS

3.1 Petroleum Contaminated Water from USTs

Water layers are present in each of the USTs between the liquid oil top layer and the oil sludge bottom layers. The water layer in each tank is expected to contain low levels of petroleum hydrocarbons, volatile organic compounds, and semivolatile compounds. Each water layer will be sampled and analyzed for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs) Priority Pollutant Metals, ignitability and pH. The water layers will be pumped from each UST to UST No .43 where the water will be stored until it can be treated in the on-site WWTP. The WWTP will consist of an oil/water separator, a gravity tank, bag filters, and activated carbon treatment. Treated water will be transferred to a portable storage tank and analyzed for effluent pretreatment parameters specified in the POTW discharge permits and then will be discharged to the on-site sewer line servicing the local POTW. The Navy is responsible for obtaining the POTW discharge permit.

3.2 Pumpable No. 6 and No. 2 Fuel Oil/Sludge Mixtures

At the same time that the water layers are sampled in each of the USTs , the oil and sludge layers will also be sampled and analyzed to classify the wastes. Each UST each oil and sludge layer will be analyzed for RCRA ignitability, reactivity, full TCLP, and PCBs. If the analytical results determine that the oil and

sludge layers are found to be non-hazardous, the layers will be mixed together to enhance pumpability and will be pumped out of the USTs into an on-site portable storage tank for temporary storage and pumped into vacuum tankers for off-site shipment to disposal facilities permitted to perform fuels blending/recycling. Virgin No. 2 fuel oil may be added to the USTs if necessary to increase pumpability.

If the analytical results determine that the oil layer is non-hazardous and the sludge layer is hazardous, both layers will be resampled and analyzed for RCRA ignitability. The UST will be evaluated to determine if it is technically feasible to separate and dispose of the hazardous sludge and non-hazardous oil layer separately to minimize RCRA waste generation. If separation is feasible, the oil layer will be pumped off and stored in an on-site portable tank pending off-site disposal as a non-hazardous waste at a facility permitted to perform fuels blending/recycling. If the layers can not be separated, they will be mixed together and disposed of off-site as a RCRA hazardous waste at a TSDF permitted to perform fuels blending or incineration.

Based upon analytical data generated during the analysis of similar materials during the Tank Farm No. 5 closure, approximately 75% of the sludge is expected to be non-hazardous and 25% is expected to be RCRA hazardous due to concentrations of TCLP metal and organics above RCRA characteristic levels.

3.3 Non-Hazardous Fuel Oil

Non-hazardous fuel oil separated from RCRA hazardous sludges will be pumped from the USTs into a portable storage tank designated for non-hazardous waste storage for temporary storage. It will be pumped into vacuum tankers for transportation to a facility permitted to perform fuels blending/recycling.

3.4 Debris

Oil contaminated debris generated during sludge removal will be drummed and disposed of off-site with the non-pumpable sludge. These materials will be analyzed for RCRA ignitability, reactivity, full TCLP, and PCBs to determine waste classification prior to off-site disposal. Materials determined to be RCRA hazardous will be disposed of at a permitted RCRA Subtitle C TSDF via landfill or incineration depending upon the waste's RCRA waste codes identified. Non-hazardous waste will be disposed of off-site at a permitted Subtitle D landfill or recycling facility depending upon waste composition.

3.5 Oil Contaminated PPE

This waste stream will be classified based upon the classification of the oil/sludge which is being removed from the USTs. PPE contaminated with RCRA hazardous oil will be segregated from PPE contaminated with non-hazardous oil. Each roll-off of PPE contaminated with RCRA characteristic oil will be analyzed by TCLP to determine if the PPE oil mixture is RCRA characteristically hazardous. If the TCLP analysis determines that the mixture is RCRA hazardous, the waste will be disposed of off-site at a RCRA permitted TSDF via landfill or incineration depending upon the RCRA waste codes associated with the waste and the waste's chemical contaminants. PPE which is found to be non-hazardous via TCLP analysis will be commingled with other non-hazardous PPE for disposal at a Subtitle D facility.

3.6 Petroleum Contaminated Soil

Petroleum contaminated soil generated during shunt and loop pipe removal which contains greater than 100 ppm total petroleum hydrocarbons can not be backfilled on-site per RIDEM regulations for petroleum contaminated soil. Oil contaminated soil is expected to be non-RCRA hazardous as the primary contaminant will be No. 2 or No. 4 fuel oil. The soil will be sampled and tested via TCLP to verify the

classification as a non-hazardous waste. Oil contaminated soil will be disposed of off-site at a RCRA Subtitle D landfill or recycling facility permitted to dispose of petroleum contaminated soils.

3.7 Non-hazardous Construction Debris

This material is anticipated to consist of non-hazardous construction materials (wood, metal, concrete) which are not contaminated with petroleum, lead paint, asbestos, or hazardous materials. This material can either be disposed of at a Subtitle D landfill permitted to accept construction and demolition debris or source separated and recycled at wood, scrap metal, or concrete recycling facilities. In evaluating disposal options, Foster Wheeler Environmental will consider costs incurred in manually separating debris against disposal cost savings offered by recycling facilities when comparing overall costs of recycling versus disposal.

3.8 Asbestos Waste

Asbestos waste will be generated during the steam piping asbestos abatement activities. Asbestos insulated piping ,insulation and asbestos contaminated materials (rags, tools, PPE) will be wetted and double bagged and disposed of at a Subtitle D landfill permitted to accept asbestos wastes. Asbestos contaminated decon water will be treated on-site with a five micron filter and stored on-site for ultimate disposal in the on-site WWTP. Asbestos contaminated filters will be double bagged and disposed of with the asbestos insulation. The Asbestos Abatement contractor will be responsible for all on- and off-site management and disposal of asbestos wastes. The disposal facility selected by the Contractor for disposal of asbestos waste must be approved by Foster Wheeler Environmental and the Navy prior to any off-site disposal of asbestos waste.

3.9 Decon Water From Project Activities

Decon water generated during UST decontamination, groundwater from the Ring Drain System, and stormwater from the WWTP and storage tank secondary containments will be pumped to UST # 43 for temporary storage until it can be treated in the on-site WWTP. The WWTP will consist of an oil/water separator, a gravity settling tanks, bag filters and activated carbon treatment. Treated water will be stored in a portable storage tanks and analyzed for the effluent pretreatment parameters specified in the POTW discharge permit and then will be discharged into the on-site sewer line servicing the POTW. Decon water generated on-site during demobilization activities after demobilization of the on-site WWTP will be disposed of off-site at a RCRA permitted WWTP. Prior to off-site shipment the waste will be sampled and analyzed for RCRA ignitability, corrosivity, reactivity, and full TCLP to determine if it is RCRA hazardous for purposes of classification.

3.10 Miscellaneous Laboratory Chemicals and Commercial Chemical Products

At project close-out, Foster Wheeler anticipates having to dispose of small quantities of leftover/excess laboratory regents, decon surfactants and chemicals, and commercial products used during on-site activities. These materials will be lab packed and disposed of off-site by a licensed TSDF offering lab pack services.

3.11 Treatment Residues from Wastewater Treatment Plant

Since the WWTP will be used to treat petroleum contaminated water, the treatment residues are anticipated to consist of spent activated carbon and metal and petroleum contaminated sediments removed from the WWTP settling tanks and bag filters. Since contaminants often become concentrated in waste treatment residues, these materials will be tested for RCRA ignitability, reactivity, ignitability, and by full TCLP to

determine if the waste is RCRA characteristic. If the waste is found to be non-hazardous, it will be disposed of off-site at the same facilities used for disposal of non-hazardous petroleum contaminated soils and debris. If the wastes are found to be RCRA hazardous, they will be disposed of off-site along with RCRA hazardous drummed sludges via landfill or incineration.

3.12 Oily Liquids/Sludges from WWTP Oil/Water Separator

This material will consist of pumpable petroleum oils and sludges separated from the UST and equipment decon water. This material will be tested for RCRA ignitability, reactivity, and full TCLP to determine if the waste is RCRA characteristically hazardous. If the waste is RCRA characteristic, it will be disposed at a RCRA permitted fuels blending/recycling facility. If the material is not RCRA hazardous, it will be disposed of at a permitted waste oil recycling facility.

3.13 Scrap Steel

Scrap steel generated from removal of underground piping systems and other site activities will be decontaminated on-site by pressure washing. Pressure washing is one of the 17 BDAT technologies that have been approved by the EPA as an alternative treatment technology for hazardous waste metal debris. After visual inspection verifies that a "visibly clean metal surface" has been obtained, the metal is to be considered cleaned of any hazardous waste and can be then recycled at a scrap metal recycling facility. The disposal facility will be identified upon conclusion of Foster Wheeler Environmental's environmental assessments of local scrap metal recyclers.

4.0 DISPOSAL FACILITIES

All disposal facilities selected for off-site disposal/recycling of site generated wastes will be evaluated by Foster Wheeler Environmental and submitted to the Navy for approval prior to use. Foster Wheeler Environmental has evaluated a number of disposal companies for environmental liability, regulatory compliance, and financial stability and has signed Basic Waste Ordering Agreements with five nationwide disposal companies and is currently investigating additional companies for use by Foster Wheeler Environmental. The approved national disposal companies include:

- Envirosafe Services of Ohio, Inc.
  4350 Navarre Avenue
  Oregon, OH 43616-3518

- Laidlaw Environmental Services, Inc.
  220 Outlet Pointe Blvd.
  Columbia, SC 29210

- Clean Harbors Environmental Services, Inc.
  12 Mercer Road
  Natick, MA 01760

- Rollins Environmental Inc.
  1 Rollins Plaza
  Wilmington, DE 19899

- Advanced Environmental Technical Services (AETS)
  (Waste Management Inc./Chemical Waste Management Inc.)
  3 Gold Mine Road
  Flanders, NJ 07836

These national disposal companies operate a number of Subtitle C and Subtitle D disposal facilities located in the Northeastern United States which have potential capabilities to treat and dispose of all wastes to be generated during the closure of Tank Farm No. 4. These facilities include, but are not limited to:

- Clean Harbors of Braintree, Inc.; Braintree, MA; MAD05342637 - RCRA Fuels Blending/Recycling, Lab Packing
- CWM Resource Recovery, Inc.; West Carrollton, OH; OHD09394593 - RCRA Fuels Blending/Recycling
- Laidlaw Environmental Services Inc.; North Andover, MA; MAD000604447 - RCRA Fuels Blending/Recycling, Lab Packing
- Clean Harbors - Murphy's Waste Oil , Woburn, MA - Non-hazardous Waste Oil Recycling
- Rollins Environmental Services (NJ) Inc.; Bridgeport, NJ; NJD053288239 - Incineration
- Rollins Environmental Inc.-Aptus Inc.; Coffeyville, KS; KSD981506025 - Incineration
- Waste Management Inc.- Turnkey Landfill; Rochester, NH - Subtitle D Landfill
- Waste Management Inc.- Crossroads Landfill; Norridgewock, MA - Subtitle D Landfill
- Clean Harbors of Connecticut, Inc.; Bristol, CT; CTD00604488 - RCRA Wastewater Treatment
- Clean Harbors of Baltimore, Inc.; Baltimore, MD; MDD9800555189 - RCRA Wastewater Treatment
- AETS /Waste Management; Marlborough, MA - Lab Pack Services

Appendix C

Sampling and Analysis Plan (SAP)

US NAVY NORTHERN DIVISION
REMEDIAL ACTION CONTRACT
CONTRACT NO. N62472-94-D-0398
DELIVERY ORDER NO. 0013

SAMPLING AND ANALYSIS PLAN

TANK FARM NO. 4 REMEDIAL ACTIONS
NAVAL EDUCATION AND TRAINING CENTER (NETC)
NEWPORT, RHODE ISLAND

April 1996

Prepared by

Foster Wheeler Environmental Corporation
470 Atlantic Avenue
Boston, Massachusetts 02210

Revision	Date	Prepared By	Approved By	Pages Affected
1	5/17/96	D. Peterson	L. Horzempa	1

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1.0 PROJECT DESCRIPTION

1.1 Purpose

The purpose of this Sampling and Analysis Plan (SAP) is to describe data acquisition procedures, numbers and types of samples, methods of analysis, and quality control measures associated with data collection and analysis. Quality Control (QC) for other project activities are covered in a separate document, the Quality Control Plan (QCP) which also establishes the overall QC program for the project. This SAP is intended to be a procedural guide for all Foster Wheeler Environmental Corporation (Foster Wheeler) personnel and subcontractors involved in sampling and analysis data acquisition while implementing remedial actions for Tank Farm No. 4 at the Naval Education and Training Center, Newport, Rhode Island.

1.2 Site Location

The Site is located approximately 25 miles southeast of Providence, Rhode Island in the Town of Portsmouth, Rhode Island as shown in Figure 1-1. The Defense Highway is to the north/northwest of the site, a residential area is located to the south and east of the Site, and undeveloped woodlands are located to the north/northeast of the Site. Narragansett Bay is located 500 to 1,000 feet to the west, and Norman's Brook is located in the southwestern corner of the Site. The Site is located approximately 20 to 111 feet above sea level. Located to the south and to the north are NETC Tank Farm No. 5 and Tank Farm No. 3, respectively. Refer to Figure 1-2 for the Site Plan.

1.3 Project Description

The NETC Tank Farm No. 4 consists of approximately 90 acres of open land containing 12 large reinforced concrete underground storage tanks (USTs) owned and controlled by the Navy. The tank farm was constructed by the Navy in 1941 and was used to store fuel oils (predominately No. 6 bunker oil) until it was abandoned in the 1970's. During a period from 1974 to 1978, a number of unidentified tanks were leased and used to store No. 2 heating oil. The tank farm was not utilized for petroleum storage after this time.

In 1992, the State of Rhode Island revised UST regulations which subjected the USTs at Tank Farm No. 4 to closure requirements. The Navy initiated the process for permanent closure of the USTs, and in 1996 Foster Wheeler was selected to complete the closure of the USTs in NETC Tank Farm No. 4. Closure activities will include the removal of all contents from the USTs (the contents include a water phase, an oil phase and a sludge phase), treatment and disposal of the contents and cleaning of the USTs. Other activities include excavation and removal of shunt and loop piping at the tank farm.

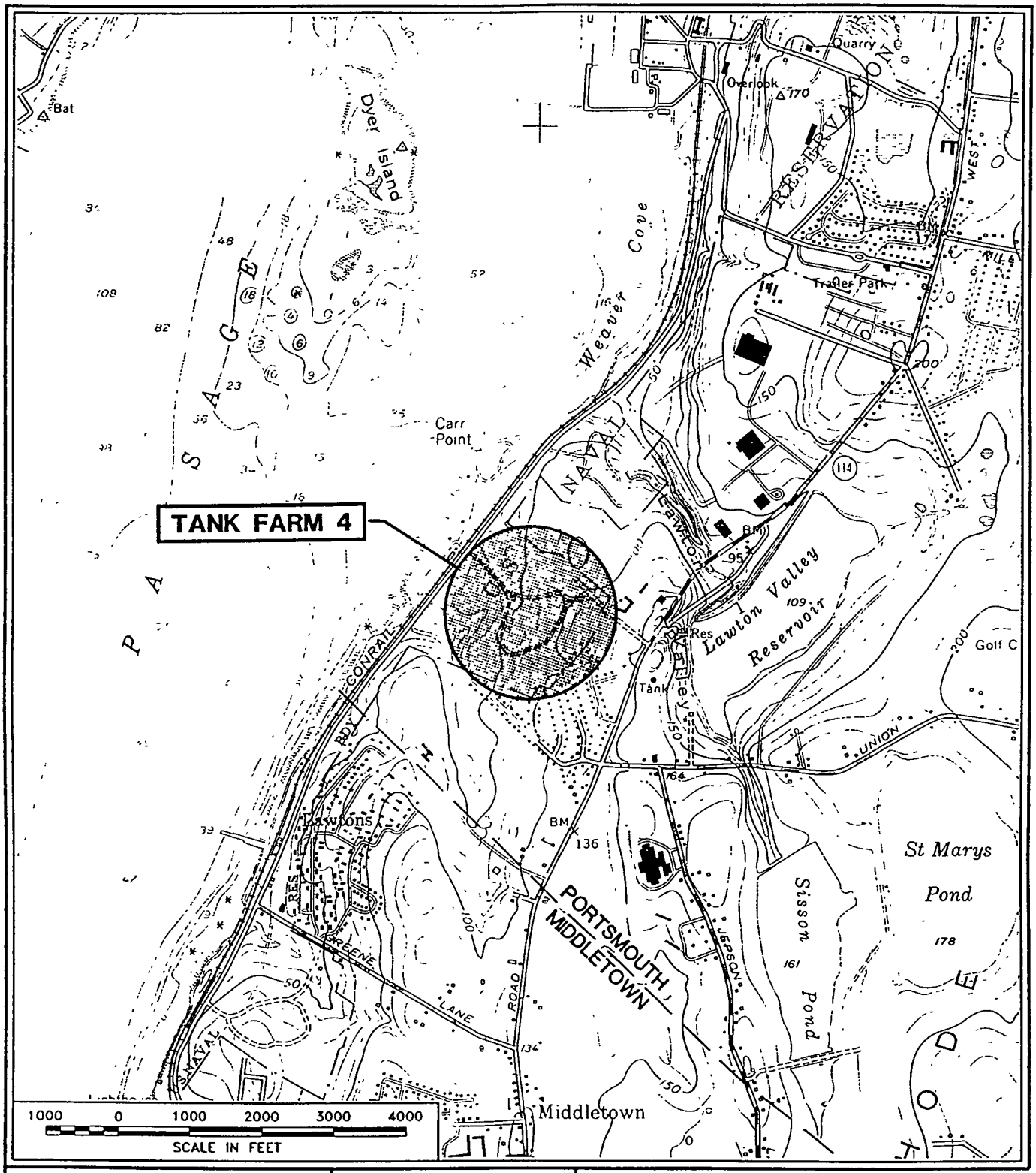


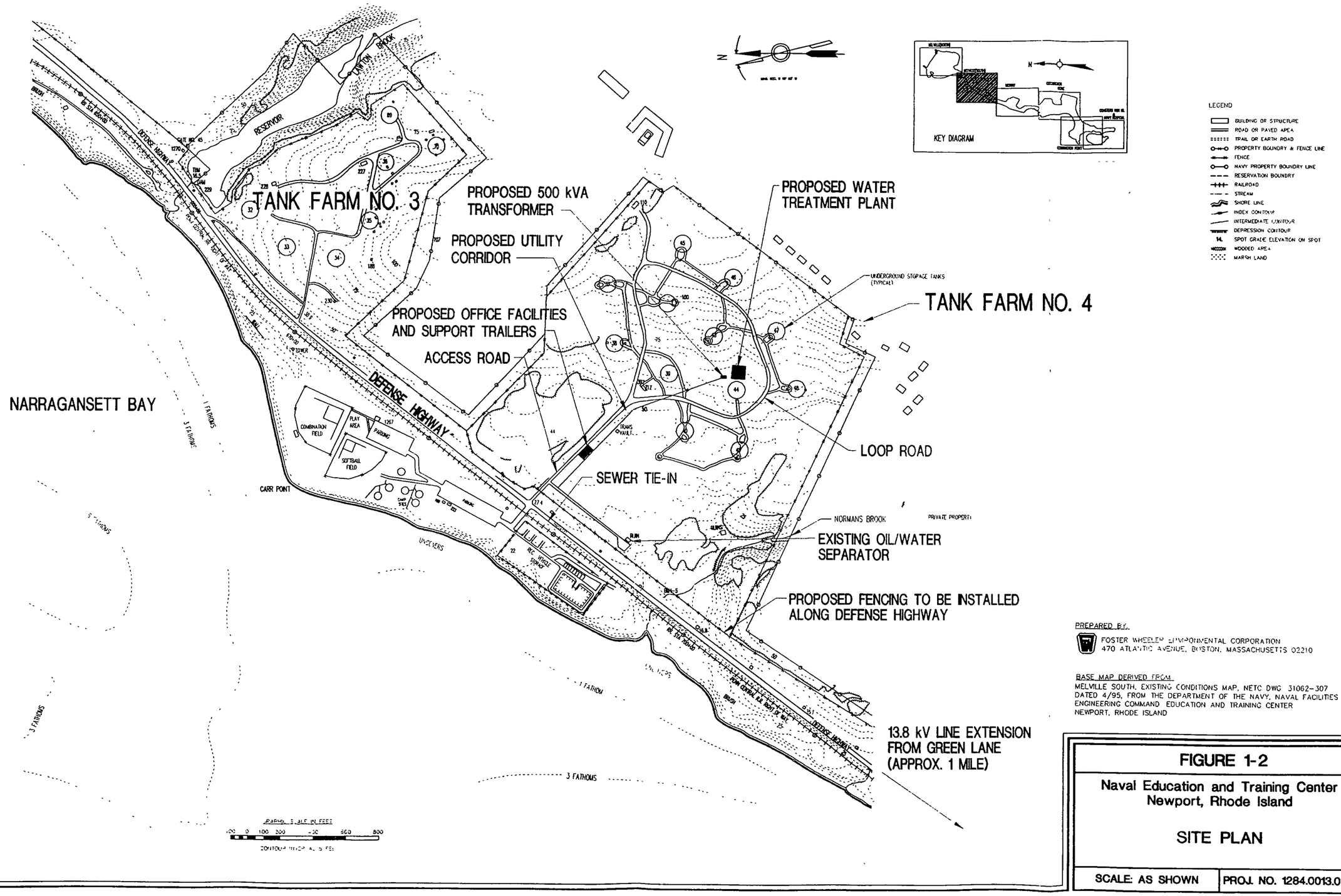
FIGURE 1-1

Naval Education and Training Center
Newport, Rhode Island

SITE LOCATION MAP

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE 1284FG11 DWG



GRAPHIC SCALE IN FEET
100 0 100 200 400 600 800
CONTOUR INTERVAL IS 5 FEET

PREPARED BY:
FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE, BOSTON, MASSACHUSETTS 02210

BASE MAP DERIVED FROM:
MELVILLE SOUTH, EXISTING CONDITIONS MAP, NETC DWG 31062-307 DATED 4/95, FROM THE DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND EDUCATION AND TRAINING CENTER NEWPORT, RHODE ISLAND

FIGURE 1-2

Naval Education and Training Center Newport, Rhode Island

SITE PLAN

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE.1284FG12.DWG
DATE:3/26/96

2.0 SAMPLING AND ANALYSIS DATA OBJECTIVES

This section gives an overview of sampling and analysis activities and their data objectives. Analytical levels used in data collection are also identified, including the analytical levels that will be utilized for this project.

2.1 Generalized Scope of Work

Sampling and analysis activities for this project will include the following:

- Tank contents gauging in order to determine volumes of oil, water, and sludge phases in each tank.
- Sampling and analysis of tank contents including water, oil, and sludge phases in order to characterize the materials for treatment or disposal.
- Sampling and analysis of water treatment plant effluent in order to ensure that the effluent discharge is in compliance with POTW requirements.
- Sampling and field screening of soils during site excavation activities in order to segregate soils for future use as backfill or for disposal.
- Sampling and analysis of suspected contaminated soils generated during site excavation activities in order to characterize the soil for disposal purposes.
- Sampling and analysis of site waste (including PPE, rags, treatment plant sludge, etc.) generated during site activities.
- Sampling and analysis of off-site borrow source soils in order to ensure that backfill materials meet site requirements.

Other activities include sampling and analysis for health and safety related air monitoring. Sampling and analysis for these items are discussed in detail in the Site Health and Safety Plan (SHSP).

All asbestos sampling will be performed by a Rhode Island licensed asbestos abatement subcontractor and inspector, and analyzed by an approved laboratory.

2.2 Development of Chemical Data Quality Objectives (CDQOs)

Chemical Data Quality Objectives are requirements needed to support decisions relative to the various stages of remedial action. To achieve the project objectives, a multi-step process is used to develop site-specific CDQOs needed for this task. CDQOs are developed to ensure that:

- Methods selected for sample analysis will provide usable detection limits sufficiently below designated action levels and that the methods will be accurate enough to quantify contamination at concentrations above action levels.
- The precision and accuracy of chemical data are well defined and adequate to provide defensible data.

- Samples are collected using approved techniques and are representative of current environmental conditions.

- Quality Assurance/Quality Control (QA/QC) procedures for both field and laboratory activities meet the Navy requirements.

2.3 QA/QC Approach

Appropriate QA/QC procedures will be implemented throughout the sampling and analysis program to ensure the attainment of project objectives. Sampling protocols will be monitored by the QA officer to ensure conformance with procedures identified in Section 3.0 of this SAP as well as the Project Work Plan and Foster Wheeler's Field Technical Guidelines as appropriate. Laboratory analysis and deliverables will be monitored by the QA officer and project QA chemist as appropriate, to ensure conformance with the analytical methods specified in Section 5.0 of this SAP. Field and laboratory QA/QC samples which are to be analyzed in support of the analytical program are summarized in Table 5-1. In the following section, the guidance levels which have been utilized in the development of the analytical support program are identified.

2.3.1 Analytical Levels

Consideration of data quality needs must begin with the identification of the analytical levels for sample analysis. Five general levels of analytical options to support data collection are identified by the USEPA. The Navy utilizes three of the analytical levels as QC requirements. The general analytical levels with corresponding Navy designations are defined as follows:

Level I — This level involves field screening or analysis using portable instruments. Results are often not compound specific and not quantitative, but qualitative results are available quickly on a "real-time" basis. It is the least costly of potential analytical options. Analytical Level I data quality on this project will be used for health and safety screening.

Level II — This level generally involves field analyses using more sophisticated portable analytical instruments; in some cases, the instruments may be set up in a mobile laboratory on-site. There is typically a wide range in the quality of data that can be generated. The data quality depends on the use of suitable calibration standards, reference materials, and sample preparation equipment; and the training of the operator. Results are available in real-time or within several hours after completion of field activities.

Level III, Navy Level C — This level generally involves conducting analyses in an off-site analytical laboratory according to specifically referenced analytical methods. Analytical Level III analyses may or may not use USEPA Contract Laboratory Program (CLP) procedures, but usually do not utilize the validation or documentation procedures required of CLP Analytical Level IV analysis. The laboratory may or may not be a CLP laboratory. Most off-site chemical analyses for project samples will utilize DQO Level III SW846 methods.

Level IV, Navy Level D — This involves use of EPA CLP-equivalent Routine Analytical Services. Analyses are performed in an off-site CLP or equivalent analytical laboratory following rigorous QA/QC protocols and documentation. Data are subsequently validated according to EPA guidelines. Certain off-site chemical analyses may utilize protocols consistent with DQO Level IV requirements when rigorous confirmation and documentation are required.

Level V, Navy Level E ---- This involves the use of special analytical services which are not covered by the CLP-equivalent Routine Analytical Services. Anlaysis are performed in an off-site analytical laboratory which may or may not be a CLP laboratory. Method development or method modifications may be required for specific constitiuents or detection limits. CLP Special Analytical Services are designated Analytical Level V.

2.3.1.1 Site Application

Data collected at this site will conform to Level I and Level III, Navy Level C. Level I data will be generated during field screening activites. Level III, Navy Level C data will be generated during other water and soil collection and analysis performed for the Site.

3.0 SAMPLING PROGRAM PROCEDURES AND REQUIREMENTS

This section discusses and summarizes the field activities described in the Scope of Work and summarized in Section 2.1, and identifies field sampling requirements for this program.

3.1 Quality Control Sample Requirements

The following section describes quality control sample requirements for this sampling and analysis program. QA/QC samples are analyzed for the purpose of assessing the quality of the sampling effort and of the analytical data. QA and QC samples include field duplicate and referee duplicate samples, equipment rinsates, trip blanks, and field blank samples. The descriptions below include how samples are to be taken, sample frequencies, and purpose of the samples.

3.1.1 Field Duplicate Samples

Field duplicate samples are multiple grab or composite samples, collected separately, that equally represent a medium at a given location and time. This is the required type of co-located sample for Volatile Organic Compound (VOC) analyses and for aqueous samples. Field duplicates will be collected at a frequency of 10% for Navy Level C samples.

3.1.2 Referee Duplicate QA Samples

Referee grab or composite samples are collected, homogenized, and split and sent to a referee QA laboratory if the Navy or regulators collect split samples or if a special problem occurs in sample collection or analysis. Volatile Organic Compound (VOC) samples are not homogenized and are grab samples taken separately at the same location and time. Referee duplicates are not anticipated for this project at this time.

3.1.3 Equipment Rinsates

Equipment rinsates are samples consisting of a reagent (analyte free) water collected daily during a sampling event from a final rinse of sampling equipment after the decontamination procedure has been performed. The purpose of equipment rinsates is to determine whether the sampling equipment is causing cross contamination of samples.

3.1.4 Field Blanks

Field blanks are samples consisting of a analyte free reagent water source utilized for the decontamination of sampling equipment procedure. The purpose of field blanks is to determine whether the water used for decontamination is of sufficient quality and to ensure it is not contributing contamination to the samples. One field blank from each event and source of decontamination water will be collected and analyzed for the same parameters as the related samples.

3.1.5 Trip Blanks

Trip Blanks are containers of organic-free reagent water that are kept with the field sample containers from the time they leave the laboratory until they are returned to the laboratory. The purpose of trip blanks is to determine whether samples are being contaminated during transit or sample collection. Trip blanks pertain only to volatile organic analyses (VOA); therefore, the containers must contain no headspace. One trip blank will be included with each cooler containing samples for volatile organic analysis.

3.2 Equipment Decontamination Procedures

For the Tank Farm No. 4 Sampling and Analysis program, both disposable and non-disposable sampling equipment may be used. All non-disposible sampling equipment will be decontaminated prior to collecting each sample. The following sequence will be used .

- Remove all visible contaminants using laboratory detergent and potable water.
- Rinse with potable water.
- Rinse with deionized water.
- Rinse with methanol followed by hexane for organic sampling equipment. For inorganic sampling equipment, rinse with 10% nitric acid in water, then rinse with deionized water again.

Decontamination fluids generated will be collected and stored on site for later disposal as specified in the Transportation/Disposal Plan.

3.3 Sampling Programs

Several sampling programs from various media around the site will be conducted as part of this remediation activity. Specific sampling protocols are identified below. A summary of sampling programs anticipated for this project is included in Table 5-1. Sample containers, preservatives, and analytical holding times are included in Table 5-2.

3.3.1 Tank Contents Guaging

The contents of each tank will be gauged in order to determine the volume of the suspected oil, water, and sludge phases. An oil/water interface probe attached to a measuring tape will be used in order to determine the level of each phase present. The probe will be slowly lowered into the tank until the depth of each phase has been recorded. The volume of each layer will then be calculated.

3.3.2 Tank Contents Sampling

Samples will be taken of each tank contents including all three phases (water, oil, and sludge). The samples will be taken in order to characterize the materials for treatment or disposal. All sampling equipment will be decontaminated as described in Section 3.2 prior to use. Table 5-1 indicates anticipated numbers of samples, specific analytical methods, and QA/QC sample quantities for this activity. Samples will be taken utilizing the following procedures;

- A composite sample will be taken of the tank water layer utilizing stainless steel/teflon vertical water sample bottles. One sample will be taken from each access point of the tank. These subsamples will be composited in one sample for analysis. The composite sample will be placed in the appropriate sample bottles. The volatiles sample will not be composited. The volatiles sample will be a grab sample taken from the location closest to the center of the tank and at a depth which is at least one foot away from both the water/oil and water/sludge interfaces. The volatiles sample vial will be the first container filled from the grab sample. The sample will be analyzed for ignitability, pH, volatiles, semi-volatiles, and priority pollutant metals as indicated in Table 5-1.

- A composite sample will be taken of the tank oil layer utilizing stainless steel/teflon vertical water sample bottles. One sample will be taken from each access point of the tank. These subsamples will be composited in one sample for analysis. The composite sample will be placed in the appropriate sample bottles. The sample will be analyzed for PCBs, and full TCLP as indicated in Table 5-1.

- A composite sample will be taken of the sludge in the bottom of the tanks. A clamshell dredge sampler or similar device will be utilzed for sampling of the sludge. One sample will be taken from each access point of the tank. These subsamples will be composited into one sample for analysis. The sludge subsamples will be taken over the entire depth of the sludge, the sample will be composited and homogenized in a stainless steel bowl, and place in the appropriate sample bottles. The sample will be analyzed for PCBs and full TCLP as indicated in Table 5-1.

3.3.3 Treatment Plant Sampling

Samples will be taken of treatment plant effluent water in order to ensure that the POTW permit requirements are being met. Samples will be taken and analyzed as required by the POTW permit. Influent water samples will be taken to ensure that the water being treated meets treatment plant design criteria. Influent and effluent samples will be taken daily during start-up operations (anticipated to be two days), weekly for the first month of operation, and monthly thereafter. Table 5-1 indicates anticipated numbers of samples, specific analytical methods, and QA/QC sample quantities for this activity. It is anticipated that both grab and composite samples will be required for the following analyses;

- BOD
- COD
- pH
- TSS
- Cyanide (total and amenable)
- Oil and Grease
- Ammonia
- Sulfides
- Sulfate
- Chloride
- Fluoride
- Phenols
- Volatiles
- Semi-Volatiles
- PCB/Pesticides
- Priority Pollutant Metals (including hexavalent chromium), plus iron, gold, tin.

The data will be compared to effluent limits identified in Table 3-1. The sample frequencies, analyses, and effluent limits identified are subject to change upon receipt of the permit.

3.3.4 Soil Excavation

Excavation is anticipated to include excavation for shunt and loop piping, excavation in order to gain access to tanks and pump rooms, and temporary utilities installation. Sampling and analysis will include initial screening in order to segregate soils during excavation into stockpiles containing varying levels of potential contamination, and testing of stockpiled soils. Table 5-1 indicates anticipated numbers of samples, specific analytical methods, and QA/QC sample quantities for this activity.

Table 3-1
Treatment Plant Effluent Limits

Analyte (1)	Maximum Limit Concentration (milligrams per liter)
Cadmium	0.8
Chromium (trivalent)	3.0
Chromium (hexavalent)	1.0
Copper	1.0
Gold	3.0
Iron	15.0
Lead	0.1
Nickel	3.0
Silver	3.0
Tin	0.0
Zinc	1.2
Metals (not mentioned above)	2.0
Cyanides	0.0
Sulfides	100.0
Sulfates	500.0
Floating Oil	0.0
Fluoride	5.0
Mercuric Chloride (as mercury, Hg)	0.5
Phenols	1.0
Solvents	0.0
TSS	285.0
COD	230.0
BOD	230.0
pH	5 - 10
Temperature	< 104 °F
Oil and Grease	25.0
TTO (2)	2.0

NOTES: (1) Only analytes with specific limits are listed.
(2) The sum of EPA Method 624, 608, and 625 compounds.

3.3.4.1 Soil Screening for Stockpile Segregation

Soils will be segregated during excavation and staged or stockpiled based on non-methane flame ionization detector (FID) readings, evidence of petroleum discoloration, or evidence of petroleum odors. The three categories will be defined as follows;

- Soil staged next to excavation - Samples giving a FID reading of less than 10 units, no evidence of discoloration, and no evidence of petroleum odors.

- Stockpile Area 1 - Samples giving a FID reading of greater than 10 units and less than 100 units, and/or exhibiting the presence of discoloration, and/or exhibiting the presence of petroleum odors. Individual stockpiles within a given area will be 400 cubic yards or less.

- Stockpile Area 2 - Samples giving a FID reading of greater than 100 units, and/or exhibiting the presence of discoloration, and/or exhibiting the presence of petroleum odors. Individual stockpiles within a given area will be 400 cubic yards or less.

3.3.4.2 Segregated Soil Sampling and Analysis

Soils that have been screened and segregated as identified in Section 3.3.3.1 will be analyzed for the following parameters;

- Soil staged next to excavation - No additional testing will be performed on this soil. The soil will be used as backfill.

- Stockpile Area 1 - Each stockpile of 400 cubic yards or less will be tested initially for Total Petroleum Hydrocarbons (TPH) by EPA Method 8015 modified. One sample will be taken from each of four corners and one in the center of each stockpile at a depth of one foot below the surface, for a total of five sub-samples. These five subsamples will be composited in one sample for analysis. If the TPH result is 100 ppm or less, the soil will be utilized as backfill. If the TPH result is greater than 100 ppm, additional testing will be performed in order to characterize the material for disposal. Analysis will include full TCLP, PCBs, ignitability, and reactivity.

- Stockpile Area 2- Each stockpile of 400 cubic yards or less will be tested in order to characterize the material for disposal. Analysis will include TPH, full TCLP, PCBs, ignitability, and reactivity. One sample will be taken from each of four corners and one in the center of each stockpile at a depth of one foot below the surface, for a total of five sub-samples. These five subsamples will be composited into one sample for analysis.

3.3.5 Waste Sampling

Waste generated during site activities will be sampled in order to characterize the waste for disposal. Waste will include but not be limited to PPE, rags, construction debris, treatment plant sludge, spent filter bags, and treatment plant spent activated carbon. Table 5-1 indicates anticipated numbers of samples, specific analytical methods, and QA/QC sample quantities for this activity. Additional testing and testing frequencies may be required by the disposal facility.

Sampling of wastes are anticipated to include sampling of solid and liquid drummed waste, as well as bulk contaminated PPE and contruction debris in roll-offs.

3.3.5.1 Solid Waste in Drums

A grab sample will be taken of drummed solid wastes. One sample will be taken per waste stream. The sample will be placed in the appropriate sample bottles. The sample will be analyzed for ignitability, reactivity, corrosivity, and full TCLP as applicable to the particular waste stream.

3.3.5.2 Liquid Waste in Drums

A grab sample will be taken of drummed liquid waste. A drum thief will be slowly lowered into the drum and the content will be placed into the appropriate sample bottle. The sampler will ensure that the sample is taken over the entire depth of the drum. One sample will be taken per waste stream. The sample will be analyzed for ignitability, corrosivity, reactivity, and full TCLP as applicable to the particular waste stream.

3.3.5.3 Waste in Roll-Offs

A composite sample will be taken of roll-offs containing contaminated debris. One sample will be taken from each of four corners of the roll-off, for a total of four sub-samples. These four subsamples will be composited into one sample for analysis. Analysis will include full TCLP, PCBs, ignitability, and reactivity as applicable to the particular waste stream.

3.3.6 Clean Fill Sampling

Clean soil will be transported to the site to aid with site work. Various fill materials will be required for construction, excavation, and restoration activities. Fill materials will be tested for TPH, TCL organics and TAL metals to ensure that they meet Rhode Island state requirements. Recommendations for acceptability will made by Foster Wheeler Environmental Corporation personnel. Approval will be made by Navy personnel. One composite sample will be taken of each soil type from each borrow source. Table 5-1 indicates anticipated numbers of samples, specific analytical methods, and QA/QC sample quantities for this activity.

3.3.7 Health and Safety Air Monitoring

Site air monitoring activities will also include on-site health and safety sampling for worker protection as described in the Site Health and Safety Plan (SHSP). This program will also include both on-site real time monitoring supplemented by off-site integrated monitoring laboratory analyses. Samples will be sent to an off-site American Industrial Hygiene Association (AIHA) accredited laboratory for analysis. Details of the associated sampling procedures are presented in the SHSP.

Air monitoring for health and safety purposes will include off-site laboratory analyses for aromatic hydrocarbons by NIOSH method 1501, polynuclear aromatic hydrocarbons by NIOSH method 5515, vinyl chloride by NIOSH method 1007, and asbestos.

4.0 SAMPLE IDENTIFICATION, CHAIN-OF-CUSTODY AND HANDLING

4.1 Sample Identification and Labeling

The sample identification system that will be utilized for project will assign a unique sample identifier to each sample collected. Data management will be consistent with this sample identification system.

Each sample will be assigned the site ID, a unique code that identifies the media from which the sample was collected, and a sample number. The media identifier and the field sample number will be used to track analytical data. The protocols for assigning field sample numbers are described below.

Each sample collected will have its own identifier, which will apply for the duration of the project. The sample identifier will consist of an alpha-numeric code that will identify: the site designation, the type of sample, the sample number (or sample date for daily QC samples), and QC sample designation (if applicable).

This Tank Farm No. 4 site designation: TF4

The sample types are:

TK37WTR - Tank Number 37 water phase
TK37OIL - Tank Number 37 oil phase
TK37SLG - Tank Number 37 sludge phase
TPEF - Treatment Plant Effluent
EXSP1 - Excavation Stockpile 1
WST - Waste Disposal
FILL - Borrow Fill
HS - Health and Safety

The quality control sample designations are:

ER - Equipment Rinsate
FB - Field Blank
TB - Trip Blank
D - Field Duplicate
MS/MSD - Matrix Spike/Matrix Spike Duplicate
RD - Referee Duplicate (if required)

For example, when a water phase sample is being taken from tank 37, the sample identification will be:

TF4-TK37WTR-01

If the above sample is a field duplicate, the sample identification will be:

TF4-TK37WTR-01D

For required daily QC samples, such as an equipment rinsate for a water phase tank sample taken on May 15, 1996 the sample identification will be:

TF4-TKWTR-ER051596

Sample labels will be completed by field personnel. Labels will include the project identification, sample identification, date and time of sampling, sampler, analyses to be performed on the specific sample bottle, type of sample (grab or composite) and preservative (if applicable). Sample label will be filled out completely with indelible ink.

4.2 Sample Custody

To maintain and document sample possession, chain-of-custody (COC) procedures will be implemented. These procedures are necessary to insure the integrity of samples from the time of collection through data reporting. The COC protocol provides the ability to trace possession and handling of samples. A sample is considered under custody if it is/was:

- in a person's possession; or
- in a person's view after being in possession; or
- in a person's possession and locked up; or
- in a designated secure area.

Personnel collecting samples are responsible for the care and integrity of those samples until they are properly transferred or dispatched. Therefore, the number of people handling a sample will be kept to a minimum.

Project specific COC forms are being developed for this site. A representative form for initial work activities is presented in Figure 4-1.

COC records will be completed by the sampler. The sampler will sign the form where indicated and fill in the sample number, date, time, sample location, and analysis for each sample collected. The sample paperwork preparer will check off each sample analysis required on the COC form and check the sample label and COC record for accuracy and completeness.

4.3 Sample Tracking

When transferring custody of samples, individuals relinquishing custody and individuals receiving custody will sign, date, and record the time on the COC form. The COC form documents the transfer of samples from the sampler to the analytical laboratory. When samples are being shipped to the laboratory via courier or shipping company (Federal Express), the shipping company will be indicated as receiving custody. Upon receipt of shipment at the laboratory, a designated sample custodian will accept custody of the samples and verify that information on the sample labels matches the COC form. Pertinent information on shipment, air bill number, pickup, courier, date, and time will be recorded on the COC. It is then the laboratory's responsibility to maintain logbooks and custody records throughout sample preparation and analysis.

PROJECT: **FOSTER WHEELER ENVIRONMENTAL CORP./ NETC TANK FARM 4**

SAMPLERS: (Signature)

SAMPLE NUMBER	MATRIX	DATE	TIME	COMP	GRAB	NO. CONTAINERS	ANALYSIS: Volatiles 8260	Semi-Volatiles 8270	PCBs 8080	RCRA Metals 6010/7000	Ignitability	Reactivity	Corrosivity - pH	TCLP	TPH 8015	TCL Organics	TAL Metals			REMARKS OR SAMPLE LOCATION	PRESERVATION: ICED	SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Remarks

TASKS
- Tank Sampling
- Excavation Sampling
- Waste Testing

NETC
TANK FARM 4
CHAIN-OF-CUSTODY RECORD

COC wpd
4/22/96

4.4 Sample Packing and Transportation

Samples for off-site laboratory analysis will be shipped via overnight delivery service in waterproof coolers using the following procedures. In general, the samples taken for this project will be considered low-level or environmental samples for packaging and shipping purposes. If samples are encountered that contain sufficient concentrations of hazardous materials, Department of Transportation (DOT) and International Air Transport Association (IATA) shipping requirements will be observed. The sample packing procedures are:

- After filling out the pertinent information on the sample label, if necessary cover the label with clear tape and put the sample in the bottle or vial and screw on the lid.
- Place about three inches of inert cushioning material such as vermiculite or bubblepack in the bottom of the cooler.
- Enclose the bottles in clear plastic bags through which sample tags and labels are visible, and seal the bag. Place bottles upright in the cooler in such a way that they do not, and will not, touch during shipment.
- Put in additional inert packing material or foam inserts to partially cover sample bottles (more than halfway).
- Fill cooler with cushioning material.
- Place bags of ice around, among, and on top of the sample bottles.
- Put paperwork (chain-of-custody record) in a waterproof plastic bag and tape it with masking tape to the inside lid of the cooler.
- Tape the drain shut.
- Secure lid by taping. Wrap the cooler completely with strapping tape at a minimum of two locations. Do not cover any labels.
- Attached completed shipping label to top of the cooler.
- Affix two signed and dated custody seals on opposite corners.

Prior to shipping, samples will be stored on ice and a trip blank will be placed with volatile organic samples from the time of sample collection.

5.0 LABORATORY ANALYTICAL PROCEDURES AND REQUIREMENTS

The anticipated number of samples, analytical methods, number of QC samples are identified in Table 5-1. The sample containers, preservatives, and analytical holding times are identified in Table 5-2. All analytical methods utilized for this project will be EPA approved methods (with the exception of Health and Safety analytical methods which will be NIOSH approved). All laboratory analysis will be performed in strict accordance with method QA/QC requirements and protocols. The contract laboratory utilized for this project will be NEESA certified for all parameters. The laboratory performing health and safety analysis will be AIHA certified for all methods (NEESA certification does not apply).

5.1 Analytical Procedures

As indicated in Table 5-1, EPA SW846 methods will be utilized for most tank, soil and solid waste analysis. EPA 600 Methods will be utilized for aqueous waste treatment plant samples.

Each analytical method utilized for this project will include the analysis of laboratory reagent blanks at a frequency of one per day or one per analytical batch of samples, as required by the analytical methods. Matrix spike (MS) and matrix spike duplicate (MSD) analysis shall be run on one in twenty samples (or per analytical batch) for all soil, water, and oil parameters. For metals and wet chemical analysis, a laboratory duplicate sample will be substituted for the MSD sample.

Routine method detection limits are anticipated for this project. A review of current project requirements indicate that standard detection limits are appropriate to meet project needs.

5.1.1 Total Petroleum Hydrocarbons

As indicated in the SOW, soil Total Petroleum Hydrocarbon (TPH) analysis will be performed by EPA Method 8015 modified. The analysis will include both the Diesel Range Organics (DRO) and Gasoline Range Organics (GRO). It should be noted that EPA Method 8015 is a gas chromatography (GC) method and results are generally not comparable with results obtained by EPA Method 418.1 which is an infrared (IR) method.

5.2 Laboratory Reporting Requirements

Laboratory reports will be in compliance with NEESA level specified reporting requirements and will include, but are not limited to the following:

- The name, address, and phone number of the analytical laboratory.
- Signature of an authorized laboratory individual, indicating the acceptability of the data.
- A copy of signed chain of custody forms, indicating the condition of samples at the time of receipt by the laboratory.
- Sample results reported in units of g or mg per liter or kg. Results will be reported on a dry weight basis and will include correction for dilution/concentration factors.

- Sample results will include a summary of pertinent chain of custody and tracking information (i.e., dates of preparation and analysis, analytical instrumentation, calibration information, associated QC samples, etc.). Other raw data including chromatograms must be on file at the laboratory and available for review upon request.

- Quality control results reported are to include spiking concentrations and acceptable limits. QC results that exceeded criteria and corrective actions should be discussed by the laboratory.

5.3 Data Review

Data will be reviewed to ensure that data reported by the laboratory meets all NEESA requirements as well as requirements of this program. QA/QC data will be reviewed to evaluate the usability of the data to attain project objectives.

Table 5-1
Summary of Sampling Programs, Methods, QC Sample Requirements

Sampling Program/Anal	Method No.	Field Samples	Equipment Rinsate Duplicates	Field Blanks/ Trip Blanks	MS/MSD (1)	Total Number of Samples
TANK CONTENTS SAMPLING						
WATER						
VOC	SW846 8260	11	11/2	1/11	2/2	39
SVOCs	SW846 8270	11	11/2	1/na	2/2	29
Priority Pollutant Metals	SW846 6010,7000	11	11/2	1/na	2/2	29
Ignitability	SW846 1010 or 1020	11	11/2	na	na/2	26
pH	SW846 9040	11	11/2	na	na/2	26
OIL						
TCLP VOC	SW846 1311/8260	11	11/2	1/11	2/2	39
TCLP SVOCs	SW846 1311/8270	11	11/2	1/na	2/2	29
TCLP Herbicides	SW846 1311/8150	11	11/2	1/na	2/2	29
TCLP Pesticides	SW846 1311/8080	11	11/2	1/na	2/2	29
TCLP Metals	SW846 1311/6010,7000	11	11/2	1/na	2/2	29
Ignitability	SW846 1010 or 1020	11	11/2	1/na	na/2	27
Reactivity - Cyanide	SW846 Sec. 7.3.3.2/9010	11	11/2	1/na	2/2	29
Reactivity - Sulfide	SW846 Sec. 7.3.4.2/9030	11	11/2	1/na	2/2	29
PCBs	SW846 8080	11	11/2	1/na	2/2	29
SLUDGE						
TCLP VOC	SW846 1311/8260	11	11/2	1/11	2/2	39
TCLP SVOCs	SW846 1311/8270	11	11/2	1/na	2/2	29
TCLP Herbicides	SW846 1311/8150	11	11/2	1/na	2/2	29
TCLP Pesticides	SW846 1311/8080	11	11/2	1/na	2/2	29
TCLP Metals	SW846 1311/6010,7000	11	11/2	1/na	2/2	29
Ignitability	SW846 1010 or 1020	11	11/2	1/na	2/2	29
Reactivity - Cyanide	SW846 Sec. 7.3.3.2/9010	11	11/2	1/na	2/2	29
Reactivity - Sulfide	SW846 Sec. 7.3.4.2/9030	11	11/2	1/na	2/2	29
TREATMENT PLANT SAMPLING						
WATER						
BOD (effluent only)	EPA600 405.1	15	na/2	na	na/2	19
COD (effluent only)	EPA600 410.1 or 410.4	15	na/2	na	2/2	21
pH	EPA600 150 1	30	na/3	na	na/2	35
TSS	EPA600 160 2	30	na/3	na	na/2	35
Cyanide(total, amenable)	EPA600 335.1	30	na/3	na	2/2	37
Oil and Grease	EPA600 413.1	30	na/3	na	na/2	35
Ammonia (effluent only)	EPA600 350.2	15	na/2	na	2/2	21
Sulfide (effluent only)	EPA600 376.1 or 376.2	15	na/2	na	na/2	19
Sulfate (effluent only)	EPA600 375.1 or 375.4	15	na/2	na	2/2	21
Chloride (effluent only)	PA600 325.1 or 325.3(with AgNO3	15	na/2	na	2/2	21
Fluoride (effluent only)	EPA600 340.1,340.2, or 340.3	15	na/2	na	2/2	21
Phenols	EPA600 420.1	30	na/3	na	2/2	37
Volatiles	EPA600 624	30	na/3	na/15	2/2	52
Semi-Volatiles	EPA600 625	30	na/3	na	2/2	37
Pesticide/PCB	EPA600 608	30	na/3	na	2/2	37
Priority Pollutant Metals, Iron, and Tin	EPA600 200.7/245.1	30	na/3	na	2/2	37
Gold	EPA600 231.1 or 231.2	30	na/3	na	2/2	37
Hexavalent Chromium	EPA600 218.4	30	na/3	na	2/2	37
SITE EXCAVATION						
STOCKPILE AREA 1 (FID >10 and <100)						
TPH (GRO and DRO)	SW846 8015 Modified	2	2/1	1/2	1/1	10
STOCKPILE AREA 2 (FID >100 or TPH >100)						
TCLP VOC	SW846 1311/8260	2	2/1	1/2	1/1	10
TCLP SVOCs	SW846 1311/8270	2	2/1	1/2	1/1	10
TCLP Herbicides	SW846 1311/8150	2	2/1	1/2	1/1	10
TCLP Pesticides	SW846 1311/8080	2	2/1	1/2	1/1	10
TCLP Metals	SW846 1311/6010,7000	2	2/1	1/2	1/1	10
Ignitability	SW846 1010 or 1020	2	2/1	na	na/1	6
Reactivity - Cyanide	SW846 Sec 7.3.3.2/9010	2	2/1	na	1/1	7
Reactivity - Sulfide	SW846 Sec. 7.3.4.2/9030	2	2/1	na	na/1	6

Table 5-1
Summary of Sampling Programs, Methods, QC Sample Requirements

Sampling Program/Anal	Method No.	Field Samples	Equipment Rinsate Duplicates	Field Blanks/ Trip Blanks	MS/MSD (1)	Total Number of Samples
WASTE SAMPLING						
SOLIDS, LIQUIDS						
TCLP VOC	SW846 1311/8260	15	na/2	na	2/2	21
TCLP SVOCs	SW846 1311/8270	15	na/2	na	2/2	21
TCLP Herbicides	SW846 1311/8150	15	na/2	na	2/2	21
TCLP Pesticides	SW846 1311/8080	15	na/2	na	2/2	21
TCLP Metals	SW846 1311/6010,7000	15	na/2	na	2/2	21
Ignitability	SW846 1010 or 1020	15	na/2	na	2/2	21
Reactivity - Cyanide	SW846 Sec. 7.3.3.2/9010	15	na/2	na	2/2	21
Reactivity - Sulfide	SW846 Sec 7 3.4 2/9030	15	na/2	na	2/2	21
PCBs	SW846 8080	15	na/2	na	2/2	21
CLEAN FILL SAMPLING						
SOIL						
TPH (GRO and DRO)	SW846 8015 Modified	2	2/1	1/2	1/1	10
TCL VOC	SW846 8260	2	2/1	1/2	1/1	10
TCL SVOCs	SW846 8270	2	2/1	1/na	1/1	8
TCL Pesticides/PCBs	SW846 8080	2	2/1	1/na	1/1	8
TAL Metals	SW846 6010,7000	2	2/1	1/na	1/1	8

NOTES

na = not applicable

(1) = laboratory duplicate substituted for MSD.

Table 5-2
Sample Containers, Preservatives, and Holding Times

Parameter	Container	Preservative	Holding Time (1)
Soil, Sludge, Oil, Waste Solid and Liquid Testing			
Total Petroleum Hydrocarbons (TPH)	(1) 2 oz. with septum-sealed lid	Ice, 4 °C	Analyze within 14 days
Volatiles (VOC)	(1) 2 oz. with septum-sealed lid	Ice, 4 °C	Analyze within 14 days
Semivolatiles (SVOC)	(1) 4 oz. wide-mouth jar	Ice, 4 °C	Extract within 14 days, analyze extract within 40 days
Pesticides/PCB	(1) 4 oz. wide-mouth jar	Ice, 4 °C	Extract within 14 days, analyze extract within 40 days
Metals	(1) 2 oz. wide-mouth glass jar	Ice, 4 °C	Analyze within 6 months (28 days for Mercury)
Ignitability/ Reactivity/ Corrosivity	(1) 8 oz. wide-mouth jar	Ice, 4 °C	None
TCLP	(1) 8 oz. wide-mouth glass jar	Ice, 4 °C	TCLP extraction within 180 days, analyze within 180 days (Mercury TCLP extraction within 28 days, analyze within 28 days).
Water Testing			
Volatiles	(2) 40 ml glass VOA vials with Teflon septa, no headspace	Ice 4° C, HCl or H2SO4 to pH <2	Analyze within 14 days
Semivolatiles	1 liter amber glass bottle	Ice, 4 °C	Extract within 7 days and analyze within 40 days of extraction
Pesticides/PCB	1 liter amber glass bottle	Ice, 4 °C	Extract within 7 days and analyze within 40 days of extraction
Metals	1 liter polyethylene container	Ice, 4 °C, HNO3 to pH <2	Analyze within 6 months except Mercury within 28 days.
Hexavalent Chromium	1 liter polyethylene container	Ice, 4 °C	24 hours
pH, TSS	1 liter polyethylene container	Ice, 4 °C	pH = immediately TSS = 7 days
BOD	1 liter polyethylene container	Ice, 4 °C	48 hours
COD, Ammonia	1 liter polyethylene container	Ice, 4° C, H2SO4 to pH <2	Analyze within 28 days.
Phenols	1 liter glass	Ice, 4° C, H2SO4 to pH <2	Analyze within 28 days.
Oil and Grease	1 liter glass	Ice, 4°C, H2SO4 to pH <2	Analyze within 28 days.
Chloride, Sulfate, Fluoride	1 liter polyethylene container	Ice, 4 °C	Analyze within 28 days.
Cyanide	1 liter polyethylene container	Ice, 4° C, NaOH to pH 12	14 days
Sulfide	500 ml polyethylene	Ice, 4 °C, zinc acetate, NaOH to pH >9	7 days

NOTES:

(1) Holding time is from the time of sampling

SITE HEALTH AND SAFETY PLAN

Site:	**NAVAL EDUCATION AND TRAINING CENTER**
Location:	**NEWPORT, RHODE ISLAND**
Prepared By:	**FOSTER WHEELER ENVIRONMENTAL CORPORATION**
Date Prepared:	**MAY 7, 1996**
Revision:	**0**
Project Description:	**REMEDIATION AND CLOSURE OF TANK FARM 4**
Delivery Order #:	**13**
Waste types:	**Liquid, Sludge, Asbestos**
Characteristics:	**Volatile, Toxic, Ignitable,**
Status:	**Active Military Installation**
Overall Hazard:	**Moderate to High**

This plan reflects the April 17, 1996 comments from the Navy.

FOSTER WHEELER ENVIRONMENTAL CORPORATION, FOSTER WHEELER SUBCONTRACTORS, AND FOSTER WHEELER'S CLIENT DO NOT GUARANTEE THE HEALTH OR SAFETY OF ANY PERSON ENTERING THIS SITE. DUE TO THE NATURE OF THIS SITE AND THE ACTIVITY OCCURRING THEREON, IT IS NOT POSSIBLE TO DISCOVER, EVALUATE, AND PROVIDE PROTECTION FOR ALL POSSIBLE HAZARDS WHICH MAY BE ENCOUNTERED. STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINATE, THE POTENTIAL FOR INJURY AT THIS SITE. THE HEALTH AND SAFETY GUIDELINES IN THIS PLAN WERE PREPARED SPECIFICALLY FOR THIS SITE AND SHOULD NOT BE USED ON ANY OTHER SITE WITHOUT PRIOR RESEARCH AND EVALUATION BY TRAINED HEALTH AND SAFETY SPECIALISTS.

APPROVALS

By their signature, the undersigned hereby certify that this SHSP has been reviewed and approved for use at Tank Farm 4 at the Naval Education and Training Center, Newport, Rhode Island (NETC-Newport).

John E Holwell
SENIOR PROJECT MANAGER/ENGINEER — DATE 5/8/96

Ken Carey
SITE SUPERINTENDENT — DATE 5/9/96

Greg P. Capp
PROJECT HEALTH AND SAFETY MANAGER — DATE 5/9/96

J. Hawthorne
SITE HEALTH AND SAFETY OFFICER — DATE 5/9/96

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1.0 INTRODUCTION

1.1 Purpose

This Site Health and Safety Plan (SHSP) addresses the health and safety practices that will be employed by all site workers participating in activities at Tank Farm 4 at the Naval Education and Training Center in Newport, Rhode Island (NETC-Newport). The SHSP takes into account the specific hazards inherent to the NETC-Newport site and presents procedures to be followed by Foster Wheeler Environmental Corporation, its subcontractors, and all other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. Activities performed under this SHSP will comply with applicable parts of USACOE Manual EM 385-1-1, OSHA Regulations 29 CFR Parts 1910 and 1926, and the Foster Wheeler Environmental Corporation Health and Safety Program Manual. Many programs from the manual are referenced in this SHSP but are not included. A copy of the manual will be maintained at the site. Modifications to the SHSP may be made with the approval of the PHSM using the Field Change Request Form found in Appendix A.

1.2 Scope

This SHSP has been developed to address health and safety concerns during the closure of Tank Farm 4 at the NETC-Newport. This section of the SHSP provides a summary of the activities performed as part of and associated with closure activities. The activities are further detailed in the Work Plan and in future work packages. A copy of the work plan and work packages will be maintained on-site by the Superintendent.

The SHSP addresses the following activities:

- Site mobilization and preparation
- Water and petroleum/sludge removal
- Water treatment plant construction and operation
- Tank cleaning and repair
- Pipe removal
- Soil screening
- Site restoration
- Demobilization

1.2.1 Site Mobilization and Preparation

Clearing

Areas around tanks will be cleared for access using a hydraullic axe mowing machine. Areas near concrete access vaults will be cleared with chain saws, where needed. The area along the fenceline will be cleared to facilitate fence repair.

Security

In addition to Foster Wheeler Environmental personnel on-site, the site will be routinely monitored during (off-hours), nights, weekends and holidays by the NETC security work force.

Fence

The existing chain link fence will be repaired to limit access to the site. Temporary fencing will be erected to secure each work area.

Sewer
A permanent 6-inch cast iron line from the water treatment system to the existing sewer line will be installed. Tap into existing line with lift station in concrete wet well. Wet well capacity of 300 gpm will be achieved with two alternating pumps.

Electricity
Install 1.1 miles of new utility line on poles from Green Lane to supply 13.8 kV power, reusing existing 500 kVA transformer from Tank Farm 5, will be installed. A meter will be added to track usage. An underground line will be installed to supply power to the trailer/support zone, as well as each tank crew.

Roads
Existing access roads will be improved as necessary. Turn-offs as well as designated traffic patterns will be established. The site roads will be patched as necessary.

Decontamination
Each tank will have a temporary decontamination area for personnel and equipment decontamination.

1.2.2 Water Treatment Plant Construction and Operation

The Water Treatment Plant (WTP) will consist of three 100 gpm skids in parallel, each with oil/water separation, filtration and activated carbon filtration. The treatment plant may be enclosed in a temporary building. Water may be stored in underground storage tank (UST) 43 before treating. A flexible hose will be used to run water from each working tank to Tank 43 and from Tank 43 to the WTP. WTP will run 24 hours/day, 7 days/week. An operator will be present during all operating hours.

1.2.3 Tank Area Mobilization

The work area and access road will be widened and stabilized, as needed.

1.2.4 Water and Petroleum/Sludge Removal

Water and an oil layer will be pumped out of each tank and passed through the oil/water separator and discharged to the POTW. No. 2 fuel oil will be used to reduce the viscosity of the sludge to permit ease of collection or pumping.

1.2.5 Tank Cleaning and Repair

Preparation - Pump Room
The Pump Room for each tank will be accessed utilizing confined space entry procedures after water is removed from the room. The flanges from the Ring Drain System to the sump will be cut and the valves opened to allow for operation of the Ring Drain System. A 3-inch electric sump pump will be used to empty the Pump room and to operate the Ring Drain System. Flow rate of the ring drain system is assumed to be no greater than 30 gpm.

Tank Cleaning
The soils overlying the tank tops will be removed to allow two access holes, approximately 9 feet x 13 feet, to be cut into the tank to allow for entry by the crew as well as to provide ventilation.

The following crew will perform tank cleaning operations:

Sewer
A permanent 6-inch cast iron line from the water treatment system to the existing sewer line will be installed. Tap into existing line with lift station in concrete wet well. Wet well capacity of 300 gpm will be achieved with two alternating pumps.

Electricity
Install 1.1 miles of new utility line on poles from Green Lane to supply 13.8 kV power, reusing existing 500 kVA transformer from Tank Farm 5, will be installed. A meter will be added to track usage. An underground line will be installed to supply power to the trailer/support zone, as well as each tank crew.

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Tank Cleaning
The soils overlying the tank tops will be removed to allow two access holes, approximately 9 feet x 13 feet, to be cut into the tank to allow for entry by the crew as well as to provide ventilation.

The following crew will perform tank cleaning operations:

- Labor:
- 4 labor technicians (on manlifts)
- 2 labor technicians (as "watch")
- 1 labor technician (on floor)
- 1 Bobcat operator

- Supplies/Materials:
- 4 sets of lights for manlifts
- 10 drums/tank for final sludge removal
- 2 blowers for ventilation

- Equipment:
- 3-inch electric pumps
- 4-inch hydraullic pump
- 4 electric scissors lifts
- 8 steam cleaners
- 1 Bobcat

- Small tools (squeegees, etc.)
- Radios
- Level B PPE
- H&S Items (personnel meters, harnesses, etc.)

The crew will work in each tank on manlifts, the manlifts will be lowered into the tank via crane, and the crew will clean the surfaces of the interior columns and tank walls using steam cleaners. All washwater from steam cleaners will be pumped to WTP.

The final unpumpable sludge on the tank bottom will be collected with the Bobcat and manually placed in 55-gallon poly drums. The drums will be lifted from the tank by the crane.

Tank Repair
The cleaning crew will repair cracks as needed. Two days per tank has been assumed for repairs.

Following tank inspection, the outlet to the Ring Drain System will be capped. The tank will then be filled with water before the openings are covered with 1/2-inch steel plate.

Once all tanks are cleaned, the tank tops will be backfilled, topsoiled and seeded.

1.2.6 Pipe Removal

Pipes will be drained, cleaned and cut in place prior to removal. All wastes generated during this process will be properly collected and disposed of.

It has been assumed that the pipes run parallel with a common bottom elevation at an average depth of 5 feet. One trench will be excavated to expose all pipes. Pipe will be removed in approximately 15 foot sections and placed in containers for recycling.

Asbestos covered steam pipe will be removed first and placed into a separate container for disposal in a secured landfill. Disposal of asbestos soil may also be required to account for insulation which may fall on to underlying soils. The asbestos abatement will be performed by a licensed abatement contractor. The abatement subcontractor will submit an asbestos abatement plan.

1.2.7 Soil Screening

Soils excavated for the pipe removal will be screened for volatiles and monitored for visual and olfactory evidence of contamination. Soil will be stockpiled awaiting final disposition.

1.2.8 Site Restoration

All excavated areas will be backfilled and compacted. All disturbed areas will be restored and hydroseeded. Paved areas will be patched as necessary.

1.2.9 Demobilization

Following the completion of site activities, all equipment will be decontaminated. Temporary utilities and the WTP will be disconnected. All trailers and equipment will be removed.

1.3 Application

The SHSP applies to all personnel who wish to gain access to the site, including but not limited to:

- Client representatives
- Federal, state or local representatives
- Foster Wheeler Environmental employees and subcontractors

1.4 Summary of Major Risks

- Confined space entry
- Explosion/fire
- Oxygen deprivation
- Electrocution
- Asbestos exposure
- Exposure to diesel engine combustion by-products
- Fuel oil vapor exposure

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the Foster Wheeler Environmental Project Organization.

2.1 Senior Delivery Order Manager (DOM)

The Delivery Order Manager/Engineer is John Holwell, PE. His duties and respoonsiblities include:

- Ensures implementation of this program through coordination with the responsible Project Health and Safety Manager (PHSM)
- Conducts periodic inspections
- Participates in major incident investigations
- Ensures the SHSP has all of the required approvals before any site work is conducted
- Ensures that the PHSM or Site Health and Safety Officer (SHSO) is informed of project changes which require modifications of the site safety plan
- Has overall project responsibility for Project Health and Safety

2.2 Project Superintendent (PS)

The Project Superintendent is Jon Cary. His duties and responsiblities include:

- Ensures that the SHSP is implemented in conjunction with the designated PHSM and SHSO
- Ensures that field work is scheduled with adequate personnel and equipment resources to complete the job safely
- Ensures that adequate communication between field crews and emergency response personnel is maintained
- Ensures that field site personnel are adequately trained and qualified to work at the site
- Enforces site health and safety rules
- Investigates major incidents
- Assists in conducting daily safety briefings
- Conducts periodic site inspections
- Acts as Emergency Coordinator

2.3 Project Health and Safety Manager (PHSM)

The PHSM is an individual certified by the American Board of Industrial Hygiene as a Certified Industrial Hygienist (CIH) and by the Board of Certified Safety Professionals as a Certified Safety Professional (CSP) with experience in hazardous waste site remediation activities. The PHSM is Grey Coppi, CIH, CSP. His duties and responsibilities include:

- Provides for the development and approval of the SHSP
- Serves as the primary contact to review health and safety matters that may arise
- Approves revised or new safety protocols for field operations
- Approves individuals who are assigned HSO responsibilities
- Approves HSOs to fulfill other project roles
- Coordinates revisions of this SHSP with field personnel
- Coordinates upgrading or downgrading of personal protective equipment with the SHSO
- Assists in the investigation of major accidents
- Conducts periodic audits of the site to determine compliance with the SHSP.

2.4 Site Health and Safety Officer (SHSO)

The SHSO is a person knowledgeable in appropriate safety and health regulations with at least one year of experience or specialized training in serving in a H&S staff role on hazardous waste remediation sites. The SHSO is Tom Hawthorne. His duties and responsibilities include:

- Acts as advisor/auditor of Health and Safety Program implementation
- Works as a member of the project team to ensure implementation of site safety plans
- Ensures that all health and safety activities identified in site safety plans are conducted and/or implemented
- Identifies operational changes which require modifications to health and safety procedures and/or site safety plans, and ensures that the procedure modifications are implemented and documented through changes to the site safety plan
- Directs and coordinates health and safety monitoring activities
- Ensures that proper personal protective equipment is utilized by field teams

- Assists in conducting and documenting daily safety briefings
- Monitors compliance with this SHSP
- Notifies PHSM of all accidents/incidents
- Coordinates with the construction superintendent and PM in any accident/incident investigation
- Maintains Accident/Incident Report Forms
- Determines upgrades or downgrades of personal protective equipment (PPE) based on site conditions and/or real-time monitoring results
- Ensures that monitoring instruments are calibrated
- Reports to PHSM to provide summaries of field operations and progress
- Maintains health and safety field log books
- Inspects fuel storage area periodically

2.5 Health and Safety Technicians (HST)

Each HST assists the SHSO in monitoring compliance with the SHSP. The HST will have specialized training on hazardous waste site operations. The HSTs are David Dougherty and Victoria Wilson.

- Assists in ensuring that proper PPE is utilized by field teams
- Calibrates and utilizes monitoring instruments
- Reports to the SHSO to provide information on field activities and,
- Maintains health and safety log books.

2.6 Site Personnel

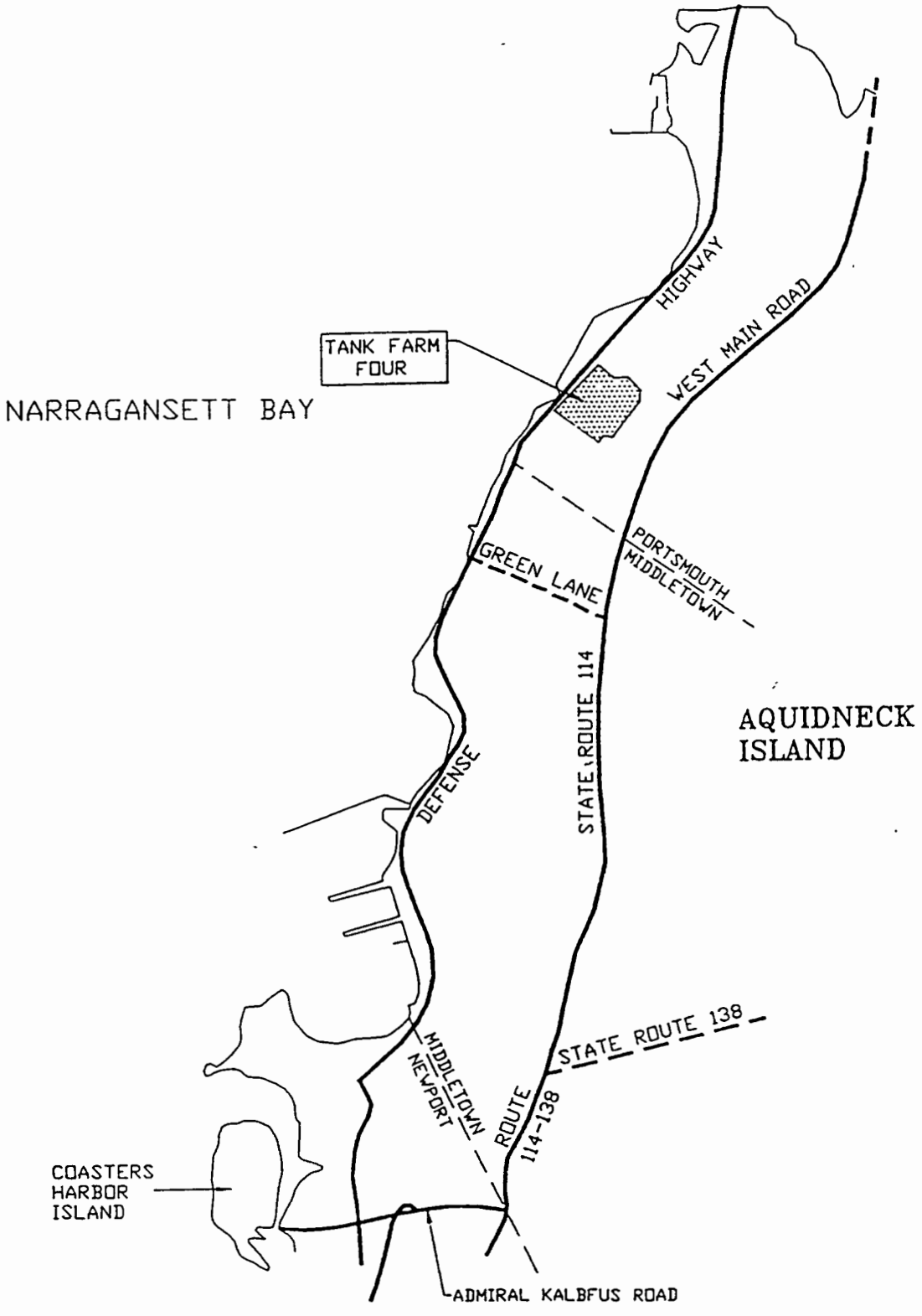
- Report any unsafe or potentially hazardous conditions to the SHSO
- Maintain knowledge of the information, instructions and emergency response actions contained in the SHSP
- Comply with rules, regulations and procedures as set forth in this SHSP and any revisions
- Prevent admittance to work sites by unauthorized personnel and,
- Inspect all tools and equipment, including PPE, daily prior to use.

3.0 SITE HISTORY AND PROJECT DESCRIPTION

3.1 Location

NETC-Newport is located in the Towns of Newport, Middletown, and Portsmouth, Rhode Island, approximately 25 miles southeast of Providence. Tank Farm 4 is situated at the northern portion of NETC-Newport. Topographic maps indicated that the tank farm site locations are located approximately 500 to 1,000 feet east of Narragansett Bay.

As referenced in Figures 3-1 and 3-2, Tank Farm 4 is bordered by the Defense Highway to the north/northwest; Norman's Brook to the southwest: residential property to the southeast; and undeveloped woodlands to the north/northwest.



Source: Brown & Root Environmental, Tank Closure Assessment Report, Nov, 1995.

Approx. scale: 1" = 4800'

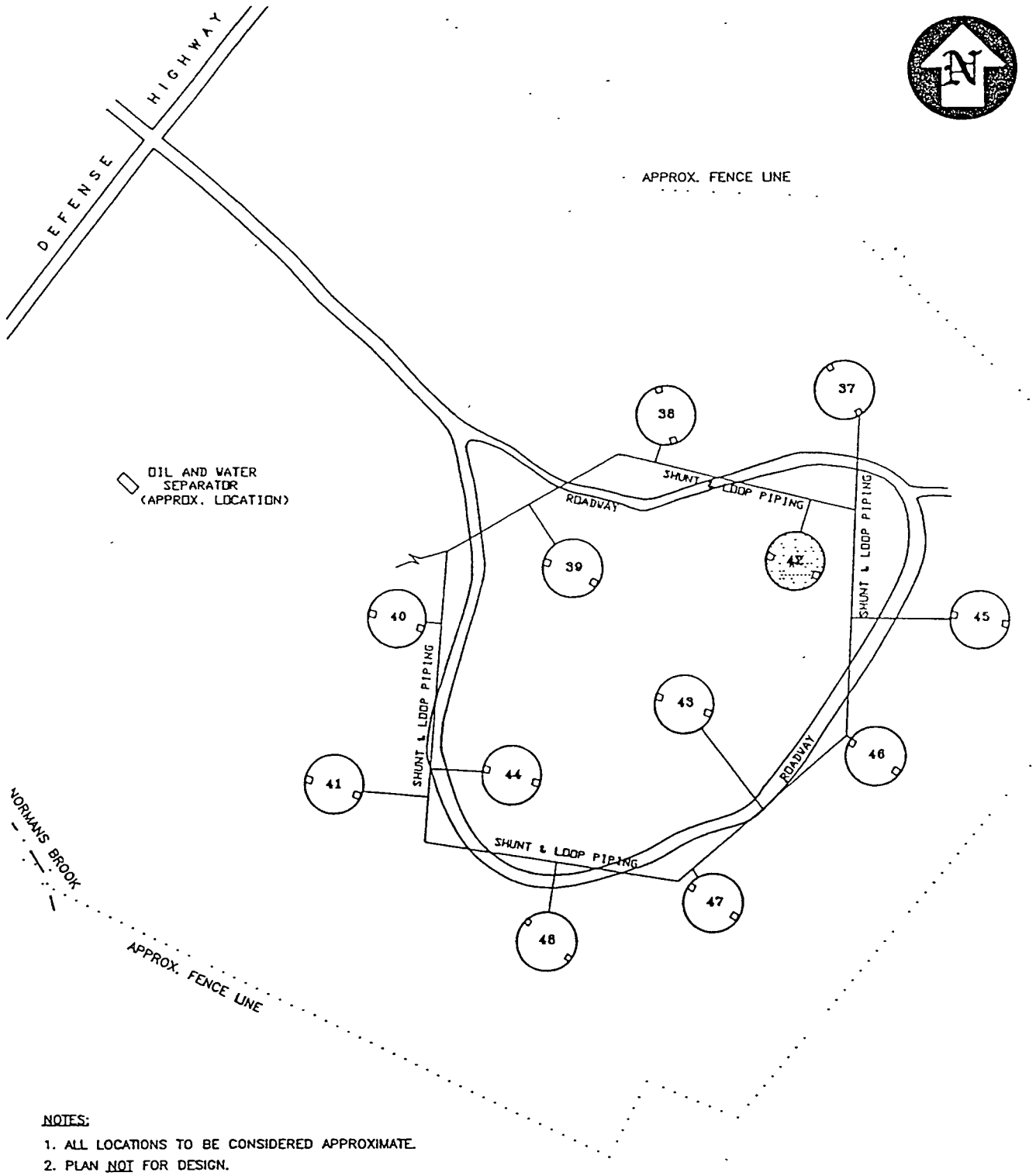
U.S. Navy RAC

NETC - Newport, RI

Figure 3-1

Site Location Map

FOSTER WHEELER ENVIRONMENTAL CORPORATION



NOTES:

1. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
2. PLAN NOT FOR DESIGN.

Source: Brown & Root Environmental, Tank Closure Assessment Report, Dec, 1995.

Approx . scale: 1" = 300'

U.S. Navy RAC

NETC - Newport, RI

Figure 3-2

Tank Farm 4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3.2 Background and Site Description

In 1941, the U.S. Navy began construction of five tank farms to store fuel oils and other petroleum products to resupply warships. Tank Farm 4 was used to store fuel oils (No. 6 bunker oil) from World War II until it was abandoned in the 1970s. For a brief period, from 1974 to 1978, three to four unidentified tanks were reportedly leased to Northeast Petroleum. The tanks were used to store No. 2 heating oil. At the end of the lease period, Northeast did not require the storage capacity. The company reportedly cleaned the tanks and terminated the lease arrangement. Tank Farm 4 was not used for petroleum storage after this time.

As a result of UST regulations enacted by the state of Rhode Island in 1992, the tanks became subject to closure requirements. The Navy has initiated the process for permanent closure of tanks at Tank Farm 4.

Tank Farm 4 is accessed from Defense Highway; occupies approximately 90 acres; and contains 12 USTs (numbers 37 through 48). These tanks were used to store virgin heavy fuel oil (No. 6 bunker oil). Several tanks were reportedly used to store No. 2 heating oil during the mid-1970s. Access to Tank Farm 4 is unrestricted. An unsecured gate is drawn across the entrance. Perimeter fencing is installed on three sides of the site. A paved road leads into the farm, passing between the tanks in a loop-like manner.

On-site structures include remnants of a building, a decommissioned electrical substation, and an abandoned oil-water separator. Ground elevations across Tank Farm 4 range between 46 feet and 111 feet above mean low water. Topography gradually slopes to the west/southwest, toward Narragansett Bay. The central portion of the farm is vegetated with tall grass, dense brush, and trees. Dense brush and woodlands cover the perimeter areas of the farm. Brush at each tank has been cleared from drill locations.

3.3 Site Characterization Data

Based on historical information provided by the Navy, it is known that Tank Farm 4 was used to store virgin No. 6 bunker oil and virgin No. 2 heating oil. Data contained in the Preliminary Closure Assessment Report of Tank Farms 4 and 5 (Halliburton NUS, June 1995) indicated the presence of contamination in the soils and groundwater surrounding the tanks. Based upon the NUS, January 1995 report, the primary contaminants of concern are aromatic hydrocarbons, total petroleum hydrocarbons and vinyl chloride.

Aromatic hydrocarbons such as benzene, toluene and xylene are typical components of fuels. Theoretically, most, if not all, of these lighter fractions of crude oil would volatilize during the oil distillation process and not be a component of No. 2 and No. 6 fuel oil. However, detector tube screening for benzene will be performed. Tank Farm 5 analytical results prepared by New England Testing Laboratory, Inc. and referenced in their March, 1994 report, indicated that volatile organics were detected in tank water. The range was from 1 ppb ethyl benzene to 568 ppb vinyl chloride. The highest benzene detected level was 29 ppb in water.

4.0 POTENTIAL HAZARDS OF THE SITE

This section presents an assessment of the chemical, biological and physical hazards that may be encountered during the tasks specified in Section 1.0. Additional information can be found in Appendix C-Activity Hazard Analyses.

4.1 Properties of Chemical Contamination

The primary contaminants of concern are aromatic hydrocarbons, total petroleum hydrocarbons and vinyl chloride. Additional chemical concerns include the generation of carbon monoxide from fossil fuel powered equipment and the potential for hydrogen sulfide (from residual crude) during tank cleaning activities. Table 4-1 provides a data summary of anticipated chemicals of concern.

4.2 Biological Hazards

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals, insects and plants.

4.2.1 Animals

During site operations, animals such as dogs, cats, raccoons, skunks, mice and snakes may be encountered. Workers shall use discretion and avoid all contact with animals. If these animals present a problem, efforts will be made to remove these animals from the site by contacting a licensed pest control technician.

4.2.2 Insects

Insects, such as mosquitoes, ticks, bees and wasps may be present during certain times of the year. Workers will be encouraged to wear repellents (DEET for Ticks) when working in areas where insects are expected to be present. If insects are prevalent, efforts will be made to remove them from the site by contacting a licensed pest control technician.

4.2.3 Lyme Disease

Since the site is located in the northeast, the potential for coming into contact with deer ticks exists. Lyme disease is caused by an infection from a deer tick which is about the size of the head of a pin. During the painless tick bite, a microorganism (spirochete) may be transmitted into the bloodstream which may lead to Lyme disease. The effects of the disease vary from person to person, which often makes it difficult to diagnose. Typically, the incubation period ranges from two days to two weeks. In most cases, the infected area will be resemble a red bulls' eye with concentric rings. Within the same period, flu-like symptoms may develop. If left untreated, the red ringed area will eventually fade and Lyme disease may further develop into an arthritis-like condition.

Control measures to prevent Lyme Disease include the following:

- Self/Buddy check of neck, hairline, groin and body after working in areas that may contain deer ticks.
- Wear light colored tyvek or clothing.
- If a tick is found, remove it by pulling gently at the head with tweezers.
- Report any of the above symptoms and all tick bites to the SHSO for evaluation. Employees bitten by deer ticks during the course of employment, will be given a medical examination.

Table 4.1
CHEMICAL DATA

COMPOUNDS	CAS#	ACGIH TLV	OSHA PEL	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS	PHYSICAL DATA
Total Petroleum Hydrocarbons	varies	None	None	inhalation, dermal	headache, dizziness, eye irritation, irritate respiratory system		
Coal Tar Pitch Volatiles	65996-43-2	0.2 mg/m3	0.2 mg/m^3	inhalation, dermal	Dermatitis, bronchitis		
Carbon Monoxide	630-08-0	25 ppm	50 ppm	inhalation	headache, dizziness, nausea, weakness confusion, coma, death	lumgs/blood carboxyhemog lobin formatiion	I.P. = 14.0 VP = 35 atm LEL = 12.5% UEL = 74%
Hydrogen Sulfide	7783-06-4	10 ppm 15C	20C	inhalation	eye irritation, irritate respiratory system, coma, death	Eyes, CNS	I.P. = 10.46 VP = 18 mm LEL = 4.0% UEL = 44.0%
Vinyl Chloride	75-01-4	5	1	inhalation	weakness, abdominal pain	leukemia, carcinogen, CNS, blood	I.P. = 10.0 VP = 3.3 atm LEL = 3.3% UEL = 36%
Benzene	71-43-2	10	1	inhalation	eye irritation, skin, headache, giddiness, nausea	blood, CNS, anemia, leukemia, carcinogen	F.P. = 120°F VP = 75 mm I.P. = 9.24 LEL = 1.2% UEL = 7.8%

Abbreviations
CNS = Central Nervous System
FP = Flash Point
IP = Ionization Potential
PPM = Parts Per Million
mg/m3 = Milligrams Per Cubic Meter Of Air
VP = Vapor Pressure
LEL = Lower Explosive Limit
UEL = Upper Explosive Limit

4.2.4 Plants

Plants such as poison ivy and poison oak may be prevalent at the site during certain times of the year. Workers will be trained to recognize these plants and to minimize contact with them. PPE may be worn by employees in order to reduce the potential for exposure. Pre-exposure topical lotions may be applied prophylactically.

4.3 Physical Hazards

Most safety hazards are discussed in the Activity Hazard Analysis (AHA) found in Appendix C for the various phases of the project. In addition to the AHAs, general work rules and other safety procedures are described in Section 10 of this SHSP.

4.3.1 Heat Stress

Heat stress is a potential hazard, which is greatly exacerbated with the use of PPE in hot environments. A heat stress prevention program will be implemented when ambient temperatures exceed 70° F for personnel wearing impermeable clothing and for other personnel when the WBGT index exceeds the ACGIH TLVs. The following are the main elements of the Foster Wheeler Environmental Corporate Health and Safety Program Manual (HS 4-6).

- Selection of PPE to reduce the risk of heat related illness
- Hydration
- Cool rest areas
- Engineering Controls (i.e. air conditioned cabs, drenching)
- Administrative Controls (work schedules, acclimatization, work/rest regimens)
- PPE (i.e. ice vests, vortex tubes)
- Monitoring (body core temperature, pulse rate)
- Identification of heat related illnesses (heat cramps, heat exhaustion, and heat stroke)
- Employee training

4.3.2 Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, poor judgment and unauthorized procedural changes. The following are the main elements of the Foster Wheeler Environmental Corporate Health and Safety Program on Cold Stress (HS 4-6).

- PPE (i.e. hard hat liners, boot and glove liners, insulated coveralls)
- Engineering controls (i.e. heaters, wind shields, covered metal handles)
- Administrative controls (i.e. work/warm up schedule, acclimatization)
- Recognition of Cold Stress Related Injury (frostbite and hypothermia)
- Warm rest areas
- Employee training

4.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps and generators. Suspected high noise operations will be evaluated by the SHSO to determine if protective measures are warranted. Workers with 8-hour TWA exposures exceeding 85 dBA will be included in the Foster Wheeler Environmental Corporation's Hearing Conservation Program (HS 4-4) as presented in the Health and Safety Program Manual. Pre-employment and annual audiograms are provided as part of the medical surveillance examination.

5.0 ACTIVITY HAZARD ANALYSES

The Activity Hazard Analysis (AHA) is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, control and mitigate those hazards. The AHAs follow the guidance of the Foster Wheeler Environmental Corporate Program Manual HS 3-5. AHAs will be developed by the SHSO and the Project Superintendent for activities not anticipated prior to start-up. The AHAs will be used to train workers in proper safety procedures during phase preparatory meetings.

AHAs addressing specific work package requirements shall be developed when necessary. Additional AHAs shall be developed and implemented for new tasks, additional work packages, or modified for existing tasks. The Navy will be copied upon AHA development.

AHAs are included in Appendix C of this SHSP. AHAs have been developed for the following phases of work:

- Site mobilization and preparation
- Water treatment plant construction and operation
- Water and petroleum/sludge removal
- Tank cleaning and repair
- Pipe removal
- Soil screening
- Site restoration
- Demobilization

6.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) detailed below represents the hazard analysis and PPE selection required by 29 CFR 1910.132. For the purposes of PPE selection, the PHSM and SHSO are considered competent persons. The signatures on the front of the SHERP constitutes certification of the hazard assessment. For activities not detailed below, the SHSO will conduct the hazard assessment and select the PPE using the form provided in Appendix D and shall certify the assessment by signing the form. PPE selection will be made in consultation with the PHSM. The task-specific level of PPE required for each task is described in Appendix C. The following is a list of PPE required for each level of work.

Level D PPE includes the following:

- Work clothes (shirts and pants)

- Gloves work (as needed)
- Steel-toed boots
- Hard hat
- Hearing protection (as needed)
- Eye protection

Level D Modified PPE includes the following:
- Site dedicated coveralls or Tyvek
- Gloves (inner surgical type and outer nitrile gloves)
- Rubber steel-toed boots or booties
- Hard hat
- Hearing protection (as needed)
- Eye protection (safety glasses and face shield; face shield required during pressure washing activities)

Level C PPE includes the following:
- Tyvek
- Gloves (inner surgical type and outer nitrile gloves)
- Hard hat
- Rubber steel-toed boots or booties
- Hearing protection (as needed)
- Full face air-purifying respirator with combination organic vapor and high efficiency particulate air cartridge

Level B PPE includes the following:
- Tyvek
- Gloves (inner surgical type and outer nitrile gloves)
- Rubber steel-toed boots or booties
- Hard hat
- Hearing protection (as needed)
- Full face air-supplied respirator with Grade D air, combination escape bottle or SCBA.

Level A PPE is not approved for this site.

Modifications for initial PPE selection may also be made by the SHSO in consultation with the PHSM. A written justification for downgrades will be provided to the PHSM for approval as a field change request.

7.0 AIR AND NOISE MONITORING

The following sections contain information describing the types, frequency and location of real time, integrated, and other air monitoring.

7.1 Real-Time Air Monitoring

This section addresses the real time air monitoring that will be conducted including instrumentation selection, air monitoring frequency and sampling location.

7.1.1 Work Area

Table 7.1 presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real time monitoring requirements for the site. Table 7.2 lists the Real Time Air Monitoring Action Levels to be used in all work areas.

The majority of the air monitoring conducted will be performed in the tanks during the confined space entry and tank cleaning. Due to the planned use of a diesel fueled bobcat during tank cleaning activities, continuous monitoring for carbon monoxide will be performed. Hydrogen sulfide will be monitored using the four gas combustible gas indicator. Detector tubes will be used for screening for benzene and vinyl chloride. Continuous forced air ventilation will be provided via an air-powered venturi type unit. Air monitoring for these contaminants will also be conducted in the exclusion zone surrounding the tank entry and ventilation area.

The following instruments will be used for work area monitoring:

- Photo-Ionization Detector, (PID)
- Combustible Gas Indicator (CGI) with Oxygen (O2), carbon monoxide and hydrogen sulfide sensors
- Detector tubes for benzene and vinyl chloride

7.2 Integrated Air Monitoring

Assessment and evaluation of field personnel exposures to airborne contaminants through integrated monitoring shall be evaluated by the PHSM and he will determine if integrated air monitoring is necessary. Generally, those employees with the greatest risk of exposure will be monitored. Other areas or personnel may be monitored if the SHSO suspects potential exposures above the capabilities of the PPE being worn.

7.3 Data Quality Assurance

7.3.1 Calibration

Instrument calibration shall be documented and included in a dedicated safety and health log book or on separate calibration pages. All instruments shall be calibrated before and after each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

Air sampling pumps used to collect worker exposure samples shall be calibrated before and after use each day. Calibration shall be accomplished using a primary standard calibration system, e.g., the bubble tube method. Results of the calibrations shall be included on air sampling data sheets.

7.3.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SHSO for reference.

TABLE 7.1 FREQUENCY AND LOCATION OF AIR MONITORING

ACTIVITY	AIR MONITORING INSTRUMENT	FREQUENCY AND LOCATION
Water Treatment Plant Operation	PID/CGI/O_2/H2S	at SHSO discretion
Pump Room Preparation	PID	Continuous during tank entry,
	CGI/O_2/CO/H2S/DiTube	Continuous during tank entry,
Tank Cleaning	PID	Continuous during tank entry,
	CGI/O_2/CO/H2S/DiTube	Continuous during tank entry,
Tank Repair	PID	Continuous during tank entry until SHSO has determined that airborne hazards are eliminated
	CGI/O_2/CO/H2S	Continuous during tank entry
Pipe Exposure/excavation	PID	Every 15 min in BZ, continuous during entry
	CGI/O_2/CO/H2S	Every 15 min in BZ, continuous during entry
	CGI/O_2/CO/H2S	Every 15 min in BZ
Soil Screening	PID	Every 15 min in BZ
Pipe Removal	PID	Every 15 min in BZ

TABLE 7.2
REAL TIME AIR MONITORING ACTION LEVELS

AIR MONITORING INSTRUMENT	MONITORING LOCATION	ACTION LEVEL	SITE ACTION	REASON
PID	Breathing Zone (BZ)	<1.0 ppm above background	No respiratory protection	–
		>1.0 ppm above background	Take benzene draeger tube	OSHA PEL for benzene is 1 ppm
		1.0 to 25 ppm, benzene present	Level C	1/2 MUC
		25 to 250 ppm, benzene present	Level B	1/2 IDLH (max)
		Background to 50 ppm, no benzene/VC	Level D	
		>50 ppm, no benzene/VC	Level C	
		>250 ppm	Level B or stop work, evacuate area, continue to ventilate, notify SHSO	
		>1 ppm above background	Take vinyl chloride detector tube	OSHA PEL for VC is 1 ppm
		>1 ppm, vinyl chloride present	Upgrade to Level B	OSHA PEL - no Level C allowable
Combustible gas indicator	In confined space entry or excavation	1% LEL <conc.<10% LEL	Use caution during procedures	Increasing potential for combustible atmosphere
		Conc.> 10% LEL	Stop work, evacuate work area, continue to ventilate area prior to continuing work, notify SHSO	Potential for combustible atmosphere
Oxygen Meter	In confined space entry or excavation, BZ	<19.5%	Stop work, evacuate work area, notify SHSO	Low oxygen, IDLH
		>22%	Stop work, evacuate work area, notify SHSO	Oxygen enriched atmosphere, explosion hazard
Carbon Monoxide	In confined space entry or excavation, BZ	> 25 ppm - 600 ppm	Stop work, evacuate work area, notify SHSO, or Level B	1/2 OSHA PEL to 1/2 IDLH
Hydrogen Sulfide	In confined space entry, excavation, BZ, or waste water treatment system	> 5 ppm	Stop work, evacuate work area, notify SHSO, or Level B	1/2 TLV

7.3.3 Data Review

The SHSO will interpret all monitoring data based on Table 7-2 and his professional judgment. The SHSO shall review the data with the PHSM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection (LOP), comparison to direct reading instrumentation and changes in the integrated monitoring strategy. The SHSO will immediately report all integrated sampling results above the PEL/TLV (one half of PEL/TLV where no respirators are worn) to the PHSM. Periodically, personnel exposure results will be tabulated and posted at the site. Monitoring and sampling data, along with all sample documentation will be periodically reviewed by the PHSM.

7.3.4. Laboratory

Chemical analysis of samples collected for assessment of employee exposures shall be performed only by an analytical laboratory accredited by the American Industrial Hygiene Association. The laboratory analysis will include field blanks, as required by the individual method or laboratory. Duplicate samples or splits with other laboratories may be used during the project. The laboratory shall also be successful participants in the PAT program for the category of material for which they are analyzing project samples.

7.4 Work Area Noise Monitoring

Work area noise monitoring will not be conducted. The SHSO in conjunction with the PHSM will determine what activities require the use of hearing protection.

7.4.1 Perimeter Noise Monitoring

Perimeter noise monitoirng will be performed at various times of the day at the discretion of the SHSO.

7.5 Other Monitoring

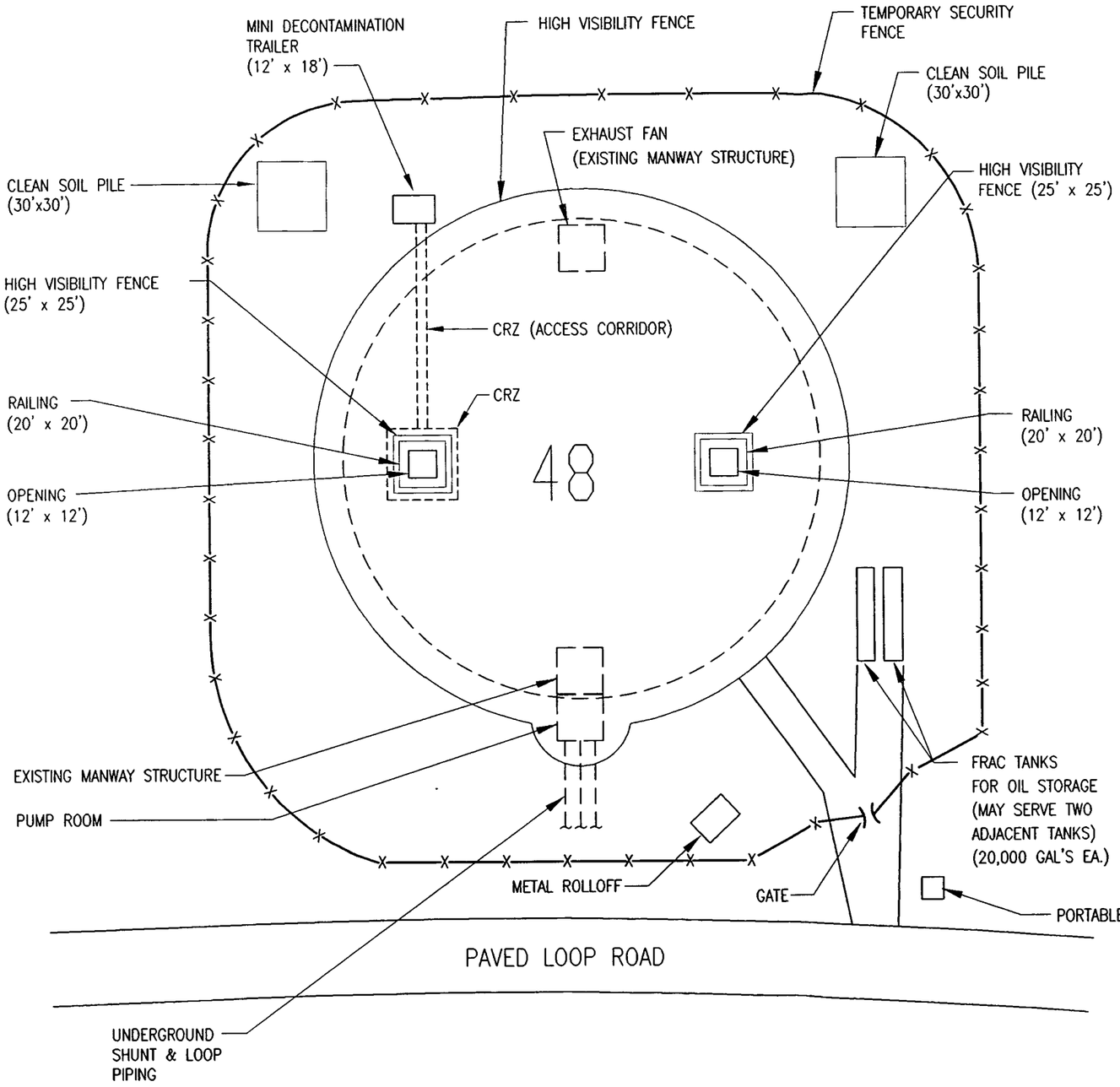
Heat stress monitoring procedures can be found in the Corporate Health and Safety Program Manual, Section 4-6 and may be implemented when necessary.

8.0 ZONES, PROTECTION AND COMMUNICATION

8.1 Site Control

Site zones are intended to control the potential spread of contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized. It shall include an Exclusion zone (EZ), Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site when operations begin.

This project is a hazardous waste remediation project, and any person working in an area where the potential for exposure to site contaminants exists, will only be allowed access after providing the SHSO with proper training and medical documentation. Foster Wheeler Environmental anticipates establishing multiple zones simultaneously at each active work area. Decontamination procedures shall be set up at each active work area to minimize or eliminate, to the extent possible, cross-contamination. Figure 8-1 depicts a typical zone set-up.



NOTE:

1. EXCLUSION ZONE IS INSIDE EACH TANK UNLESS EXPANDED BASED ON AIR MONITORING RESULTS.),
2. CONTAMINANT REDUCTION ZONE (CRZ) AND CRZ ACCESS CORRIDOR ARE SHOWN AT LEFT
3. ALL OTHER ABOVE GROUND AREA IS CONSIDERED TO BE THE SUPPORT ZONE.

FIGURE 8-1

Naval Education and Training Center Newport, Rhode Island

TYPICAL EQUIPMENT LAYOUT AND HEALTH & SAFETY ZONE AT EACH TANK LOCATION

NOT TO SCALE	PROJ. NO. 1284.0013.0103

H&S-SPZN DWG
5/9/96

Note: A Standard Operating Procedure for site preparation will be developed.

Support Zone - The SZ is an uncontaminated area (trailers, offices, etc.) that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone - The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides for an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for Exclusion Zone entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone - All activities which may involve exposure to site contaminants, hazardous materials and/or conditions should be considered an exclusion zone (EZ). This zone will be clearly delineated by cones, tapes or other means. The SHSO may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the site SHSO allowing adequate space for the activity to be completed, field members and emergency equipment.

8.2 Contamination Control

One of the most important aspects of decontamination is the prevention of contamination. Good contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel
- Do not walk through areas of obvious or known contamination
- Do not handle or touch contaminated materials directly
- Make sure all personal protective equipment has no cut or tears prior to donning
- Fasten all closures on suits, covering with tape if necessary
- Particular care should be taken to protect any skin injuries
- Stay upwind of airborne contaminants
- Do not carry cigarettes, gum, etc., into contaminated areas

Sampling, Monitoring
- When required by the HSO, cover instruments with clear plastic, leaving openings for sampling ports
- Bag sample containers prior to emplacement of sample material

Heavy Equipment
- Take care to limit the amount of contamination that comes in contact with heavy equipment
- If contaminated tools are to be placed on non-contaminated equipment for transport to the decontamination pad, use plastic to keep the equipment clean
- Keep excavated soils contained and out of the way of workers

8.2.1 Personnel Decontamination Station

Personnel exiting the Exclusion zone shall be decontaminated. Discarded protective clothing will be disposed in labeled 55-gallon drums and staged for disposal. Specific decontamination procedures will be utilized as appropriate, depending on the level of operation performed by the individual. Safety briefings shall explain these decontamination procedures for personnel and portable equipment for the various protection levels indicated in Section 6.0. Detailed waste disposal procedures are available in the FWENC Waste Disposal Plan.

The following protocol shall be used for the decontamination stations according to the level of protection:

Level D	Level D+	Level C	Level B
1. Equipment drop	1 Equipment drop	1 Equipment drop	1. Equipment drop
2 Hand/Face wash	2. Outer boot & glove wash	2. Outer boot & glove wash	2 Outer boot & glove wash
	3 Outer boot & glove rinse	3 Outer boot & glove rinse	3 Outer boot & glove rinse
	4 Tape removal - boot & glove	4 Tape removal - boot & glove	4. Tape removal - boot & glove
	5 Outer boot & glove removal	5 Outer boot & glove removal	5 Outer boot & glove removal
	6. Coverall removal/disposal	6 Coverall removal/ disposal	6 SCBA or HIP air tank removal
	7. Inner glove removal/ disposal	7 Respirator removal	7. Coverall removal/ disposal
	8. Hand/face wash	8. Inner glove removal/disposal	8. SCBA or HIP air face piece removal
	9. Shower may be required	9 Inner clothing removal	9. Inner glove removal/ disposal
		10. Hand/face wash	10 Inner clothing removal
		11. Shower may be required	11. Hand/face wash
		12. Redress	12. Shower may be required
		13. Respirator cleaning/ sanitizing	13. Redress
			14. Respiratory cleaning/sanitizing

Note: Not all of the decontamination stations will be needed; this will depend upon the type of equipment worn.

Note: At a minimum, all personnel will thoroughly wash their arms, face and hands upon exiting the EZ or CRZ prior to eating, drinking, smoking, applying cosmetics, or any other actions that would increase the risk of hand to mouth transfer of chemicals.

The following decontamination equipment is required for level D+ and higher protection levels:

Four small tubs (two sets of wash and rinse water), scrub brush, towels, contaminated clothing disposal bag or drum, and, respiratory cleaning solution.

Non-phosphate detergent and water should be sufficient for use as the decontamination solution. All receptacles for contaminated protective clothing will be equipped with lids that can be closed to prevent the release of contaminants and the collection of rainfall. The decontamination liquids and clothing will be contained and disposed according to federal, state and local regulations.

8.2.2 Heavy Equipment Decontamination

Heavy equipment will be decontaminated on a pd with a steam cleaner until no signs of visible contamination remain. Rinsate will be collected and pumped into Tank 43 for treatment or disposal per the FWENC Waste Disposal Plan. Heavy equipment will not be permitted to leave the EZ unless it has been thoroughly decontaminated and visually inspected by the SHSO or his designee. This inspection will be documented on the form found in Appendix G.

8.3 Communication

- Hand-held two-way radios are utilized as appropriate by field teams for communication with the Command Post.
- Telephones - A telephone will be located in the Command Post in the SZ for communication with emergency support services/facilities.
- Air Horns - Air horns shall be carried by field teams or be strategically located within the EZ., and shall be maintained as the means for announcing emergency evacuation procedures and backup for other forms of communication.
- Hand Signals - Hand signals shall be used by field teams along with the buddy system. They shall be known by the entire field team before operations commence and their use covered during site-specific training. Typical hand signals are the following:

SIGNAL	MEANING
Hand gripping throat	Out of air, can't breathe
Grip on a partner's wrist or placement of both hands around a partner's waist.	Leave the area immediately, no debate.
Hands on top of head	Need assistance
Thumbs up	Okay, I'm all right, I understand.
Thumbs down	No, negative.

9.0 MEDICAL SURVEILLANCE PROCEDURES

All contractor and subcontractor personnel performing field work where potential exposure to contaminants exist at the site are required to have passed a medical surveillance examination in accordance with 29 CFR 1910.120(f). Medical monitoring will not be required for the following subcontractors:

- Electrical
- Fencing
- Clearing

The Foster Wheeler Environmental Corporate Medical Surveillance Program is described in detail in Section 4.5 of the Health and Safety Program Manual. The Corporate Medical Consultant is Greaney Medical Group in California. Dr. Peter Greaney is Board certified in occupational medicine. .

Workers performing asbestos shall show evidence of passing a medical examination consistent with the requirements of 1926.1101.

9.1 Medical Surveillance Requirements

A physician's medical release for work will be confirmed by the SHSO before an employee can work in the exclusion zone. The examination will be taken annually at a minimum and upon termination of hazardous waste site work if the last examination was not taken within the previous six months. Additional medical testing may be required by the PHSM in consultation with the Corporate Medical Consultant and the SHSO if an over-exposure or accident occurs, if an employee exhibits symptoms of exposure, or if other site conditions warrant further medical surveillance.

9.1.1 Medical Data Sheet

A medical data sheet is provided in Appendix G. This medical data sheet is voluntary and should be completed by all on-site personnel and will be maintained at the site. Where possible, this medical data sheet will accompany the personnel needing medical assistance. The medical data sheet will be maintained in a secure location, treated as confidential, and used only on a need-to-know basis.

10.0 SAFETY CONSIDERATIONS

10.1 Health and Safety Work Rules

A list of work rules and safe work practices has been included in the Foster Wheeler Environmental Health and Safety Program Manual, Section 3-6. These rules have been incorporated into the SHSP as Appendix H. The work rules will be posted in a conspicuous location at the site.

10.2 Construction Hazards

The following is a list of applicable safety considerations for the major tasks. Further information is provided in the specific Activity Hazard Analysis and the Foster Wheeler Environmental Health and Safety Program Manual.

- Heavy Equipment
- Hand and Power Tool Usage
- Fire Hazards
- Motors and Pump Usage
- Crane Usage
- Manlifts

- Electrical Equipment- the electrical subcontractor performing the utility pole installation shall observe standard industry practices such as the use of dielectric helmets, lifts, insulated gloves, use of grounds or jumpers, etc.
- Slips/Trips/Falls - the gantry-type hoist that will be utilized for emergency retrieval shall be designed and approved by a competent engineer.
- Steam, Heat
- Pressurized Lines
- Punctures/Cuts
- Lifting/Materials Handling
- Handling/Storage of Fuels - The 5,000-gallon No. 2 fuel oil truck shall be labeled as to contents, hazard warning and be bermed to capture spills. Local ordinances shall be contacted by the SHSO to determine if any codes apply.
- Scaffolds

10.3 High Loss Potential Hazards

- Asbestos Removal
- Confined Space Entry/Tank Cleaning
- Excavation and Trenching
- Fall Protection/Scaffold Work
- Hot Work
- Lockout/Tagout

Asbestos Removal

Asbestos related work will be conducted in accordance with the Asbestos Control Program, Section 6-1 of the Foster Wheeler Environmental Corporation Health and Safety Program Manual. Procedures in this document incorporate the requirements of 29 CFR 1926.1101. It provides general requirements for air monitoring, safe work practices, respiratory protection, protective equipment, decontamination areas and practices, medical surveillance, record keeping requirements, employee information and training, and designation of a competent person. Asbestos removal shall be performed by a Rhode Island licensed subcontractor. The competent person will be designated by the subcontractor. The competent person will be assisted in his/her duties by other Foster Wheeler Environmental technical personnel.

Confined Space Entry

Confined space entry will be conducted in accordance with the Confined Space Entry Program, Section 6-2 of the Foster Wheeler Environmental Corporation Health and Safety Program Manual. Procedures in this document incorporate the requirements of 29 CFR 1910.146, Permit Required Confined Spaces. The program provides general requirements for safe work practices and procedures including but not limited to, hazard evaluation, atmospheric testing, ventilation, isolation, emergency and rescue procedures, pre-entry briefing, confined space operations, and training.

Excavation and Trenching

Excavation will be conducted in accordance with the Excavation and Trenching Program, Section 6-4 of the Foster Wheeler Environmental Corporation Health and Safety Program Manual. Procedures in this document incorporate the requirements of 29 CFR 1926, Subpart P-Excavations. It provides for the designation of a "Competent Person" and general requirements for safe excavating practices. The program also incorporates company standards for the monitoring of potentially hazardous atmospheres; protection from water hazards; analyzing and maintaining the stability of adjacent structures; daily Competent Person inspections; soil classification; sloping and benching; protective systems; and training.

One of the designated Competent Person(s) will be Jon Cary and Tom Hawthorne.

The Competent Person will be assisted in his duties by other Foster Wheeler Environmental technical personnel such as the SHSO, PHSM, geologists, structural engineers and soils engineers.

Trenches 4 feet or greater in depth will require atmospheric monitoring and ladders for safe entry/egress.

The Competent Person will determine the need for cave-in protection. If trenches exceed 5 feet in depth, cave-in protection will be implemented in accordance with 29 CFR 1926, Subpart P.

Fall Protection/Scaffolds

Any subcontractor involved in work greater than 6 feet aboveground shall be required to submit as part of their work plan or bid a detailed description of their fall prevention and protection plan consistent with OSHA Subpart M of 1926 and FWENC Procedure HS 3-8.

Scaffolds used to enter the tanks shall be specified, erected and maintained by a designated qualified person(s).

Hot Work

Any activity (e.g. pipe cutting) involving the potential for producing heat, open flame, sparks or other activity so defined by the SHSO shall be deemed hot work, and the requirements of the Foster Wheeler Environmental Corporation Health and Safety Procedure HS 6-6 will be followed. A fire watch shall be maintained for a period of 30 minutes following hot water cessation.

Lockout/Tagout

All activities requiring lockout/tagout procedures will be conducted in accordance with the Lockout/Tagout Program, Section 6-5 of the Foster Wheeler Environmental Corporation Health and Safety Manual; This program establishes the minimum requirements and procedures for performing lockout/tagout on machines and equipment in accordance with 29 CFR 1910.147, Control of Hazardous Energy. These procedures include but are not limited to, general requirements, testing/positioning group lockouts, tagout, shift changes, failure to clear locks and periodic inspections.

11.0 WASTE DISPOSAL PROCEDURES

All discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal as non-hazardous solid waste. Detailed waste disposal procedures, as well as overall waste management practices will be addressed as part of the Waste Management Plan. Waste management practices will be implemented with continued support from the Foster Wheeler Environmental regulatory and waste management personnel as applicable.

12.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require immediate action; therefore, contingency planning and advanced training of staff are essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures.

12.1 Responsibilities

12.1.1 Project Health and Safety Manager (PHSM)

The PHSM is Grey Coppi.

The PHSM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The PHSM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

12.1.2 Site Health and Safety Officer (SHSO)

The SHSO is Tom Hawthorne.

The SHSO is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The SHSO is required to immediately notify the PHSM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the PHSM can notify OSHA within the required time frame. The PHSM will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of $500 within 24 hours. The SHSO also serves as the Alternate Emergency Coordinator.

12.1.3 Emergency Coordinator

The Emergency Coordinator is Jon Cary.

The Emergency Coordinator shall make contact with Local Emergency Response personnel prior to beginning work on site. In these contacts the Emergency Coordinator will inform interested parties about the nature and duration of work expected on the site and the type of contaminants and possible health or safety effects of emergencies involving these contaminants. The Emergency Coordinator shall locate emergency phone numbers and identify hospital routes prior to beginning work on site. The emergency coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator shall implement the Emergency Response/Contingency Plan whenever conditions at the site warrant such action.

12.1.4 Site Personnel

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Approporiate training of all site personnel will be provided. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency.

12.2 Communication

A variety of communication systems may be utilized during emergency situations. These are discussed below.

12.2.1 Radio Communication

The primary form of communication during an emergency between field groups in the exclusion zone and the Emergency Coordinator will be radio communications. Each field team within the exclusion zone shall have a radio. During an emergency situation, the lines will be kept clear so that instructions can be received by all field teams. **All radios used on the project will be intrinsically safe.**

12.2.2 Telephone Communication

A telephone will be maintained in the office/site trailer.

12.2.3 Air Horns

Air horns will be used to alert site personnel of emergencies. The following signals will be used:

- One continuous blast - site evacuation
- Two short blasts - shut down equipment, clear radio channels, await instructions
- Three short blasts - injured employee, first-aid providers respond

Air horns will be placed at each active work area.

The procedure to activate the air horns consists of depressing the air horn button or switch while pointing it in the direction of the area to be signaled. Air horns should be tested at least monthly to ensure that they are working properly.

12.2.4 Hand Signals

Hand signals will be employed by downrange field teams where necessary for communication during emergency situations. Hand signals are found in Section 8.3.

12.3 Local Emergency Support Units

In order to be able to deal with any emergency that might occur during remedial activities at the site, a table listing emergency telephone numbers **(Table 12-1)** will be posted prominently in the field office and in all places where telephone service is available.

A route map from the site to the nearest hospital is referenced as Figure 12-1. Upon mobilization, this map will be posted adjacent to the above emergency telephone numbers in the field office and in all places where telephone service is available. It should also be placed in all on site vehicles.

12.4 Pre-emergency Planning

Foster Wheeler Environmental will communicate directly with administrative personnel from the emergency room at the hospital in order to determine whether the hospital has the facilities and personnel needed to treat cases of trauma resulting from exposure to any of the contaminants expected to be found on the site.

Before the field activities begin, the local emergency response personnel will be notified of the schedule for field activities and about the materials that are thought to exist on the site so that they will be able to respond quickly and effectively in the event of a fire, explosion, or other emergency.

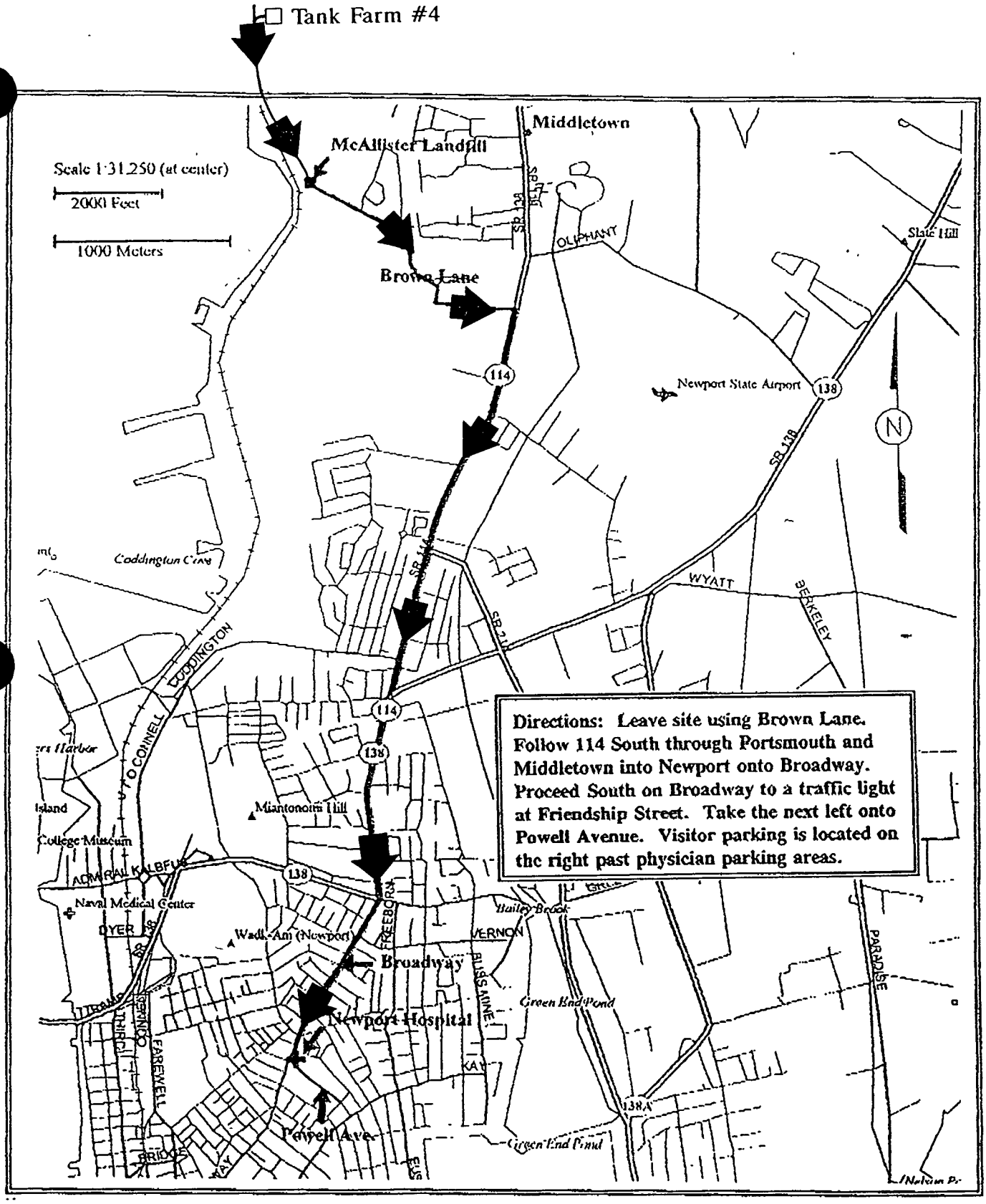
Before work on the site begins, the field staff, in cooperation with local response agencies, will hold a full emergency rescue drill to practice confined space rescue procedures.

12.5 Emergency Medical Treatment

The procedures and rules in this SHSP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the SHSO immediately. First-aid equipment will be available on site at the following locations:

First Aid Kit:	office trailer, all active work areas
Emergency Eye Wash:	office trailer, all active work areas

During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that has been set up. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.



U.S. Navy RAC
NETC - Newport, RI

Figure 12-1
Hospital Location Map

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Table 12.1
Emergency Telephone Numbers

Contact	Firm or Agency	Telephone Number
Police	NavyLocal	401-841-3241/Base 401-846-1212/Off-Base
Fire	Navy	401-841-3333/ Base 401-846-2211/Off-Base
NTR Charles Peterson	Navy ROICC	401-841-1576
NOSC/NOS CDR	Navy - Deputy Fire Chief	401-841-3333
On-site Medical Clinic	Prompt Case	401-841-3111 Hours 10am to 8pm - 7 days a week
Newport Naval Base Ambulance		841-2222
Hospital	Newport Hospital	401-864-6400
Site Project Manager Jon Cary	Foster Wheeler Environmental	401-847-7804 (Off-site)
PHSM Grey Coppi	Foster Wheeler Environmental	215-702-4079 (W) 908-757-8174 (H)
Regulatory Compliance Tom Teeling Mike Zizza	Foster Wheeler Environmental Langhorne Boston	 215-702-4078 (W) 617-457-8245 (W)
John Holwell	Foster Wheeler Environmental Delivery Order Manager	617-457-8234 (W)
SHSO Tom Hawthorne	Foster Wheeler Environmental	401-841-1764 (Off-site)
Chemtrec		(800)424-9300
National Response Center		(800)424-8802
LEPC Greg Marx		(401)847-2695

Foster Wheeler Environmental will provide at least two personnel with current First Aid and CPR certification on each active work shift.

Only in **non-emergency** situations will an injured person be transported to the hospital by means other than an ambulance.

12.6 Emergency Site Evacuation Routes and Procedures

In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The EC will take charge of all emergency response activities and dictate the procedures that will be followed for the duration of the emergency. The EC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his discretion, the EC also may order the closure of the site for an indefinite period.

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, an air horn will be sounded on the site. The horn will sound continuously for one blast, signaling that immediate evacuation of all personnel is necessary due to an immediate or impending danger. All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at the primary evacuation point. This point will be determined by the field staff prior to start of work activities.

The EC will give directions for implementing whatever actions are necessary. Any project team member may be assigned to be in charge of emergency communications during and emergency. He will attend the site telephone specified by the EC from the time the alarm sounds until the emergency has ended.

After sounding the alarm and initiating emergency response procedures, the EC will check and verify that access roads are not obstructed. If traffic control is necessary, as in the event of a fire or explosion, a project team member, who has been trained in these procedures and designated at the site safety meeting, will take over these duties until local police and fire fighters arrive.

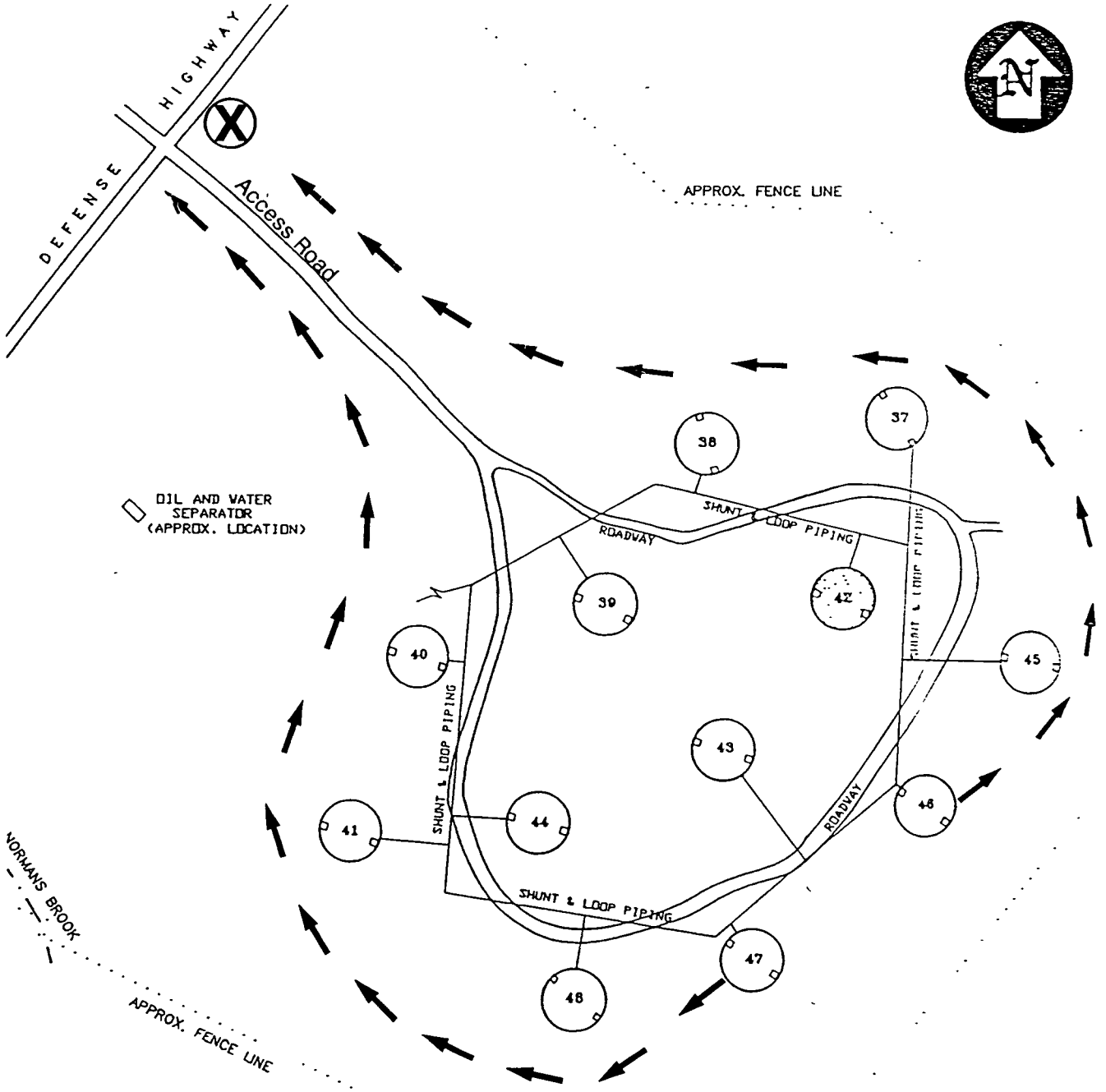
The EC will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation. A map showing evacuation routes, meeting places, and location of emergency equipment is referenced as Figure 12-2 and will be posted in all trailers and used during site-specific training.

12.6.1 Evacuation Drills

Evacuation drills will be conducted to test the emergency system. The drills will simulate situations that may be likely to occur onsite. A critique of the drill according to Foster Wheeler Environmental Health and Safety Program Manual HS 2-1 will be conducted.

12.7 Fire Prevention and Protection

In the event of a fire or explosion, procedures will include immediately evacuating the site (air horn will sound for a single continuous blast), and notification of local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).



NOTES:

1. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
2. PLAN NOT FOR DESIGN.

Evacuation route

Head count area

Source: Brown & Root Environmental, Tank Closure Assessment Report, Dec, 1995.

Approx . scale: 1" = 300'

U.S. Navy RAC

NETC - Newport, RI

Figure 12-2

Tank Farm 4 Evacuation Route

FOSTER WHEELER ENVIRONMENTAL CORPORATION

12.7.1 Fire Prevention

Fires will be prevented by adhering to the following precautions:

- Good housekeeping and storage of materials
- Storage of flammable liquids and gases away from oxidizers
- No smoking in the exclusion zone or any work area
- No hot work without a properly executed hot work permit
- Shutting off engines to refuel
- Grounding and bonding metal containers during transfer of flammable liquids
- Use of UL approved flammable liquid storage containers
- Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities
- Monthly inspections of all fire extinguishers
- Use of intrinsically safe radios, lighting, low voltage lighting

A map of all fire extinguisher locations will be developed by the site staff and will be posted in all trailers.

The person responsible for the maintenance of fire prevention and/or control equipment will be determined.

The person responsible for the control of fuel source hazards will be determined.

12.8 Overt Chemical Exposure

The following are standard procedures used to treat chemical exposures. Other specific procedures detailed on the Material Safety Data Sheet or recommended by the Corporate Medical Consultant will be followed, when necessary.

SKIN AND EYE CONTACT:	Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.
INHALATION:	Move to fresh air. Decontaminate and transport to hospital or local medical provider.
INGESTION:	Decontaminate and transport to emergency medical facility.
PUNCTURE WOUND OR LACERATION:	Decontaminate and transport to emergency medical facility.

12.9 Decontamination During Medical Emergencies

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or postponed. The SHSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or

aggravate the problem. Respiratory equipment must always be removed at the site. Protective clothing can be cut away at the site. If the outer contaminated garments cannot be safely removed on-site, a plastic barrier placed between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the standard decontamination procedures will be followed.

12.10 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

- Project Health and Safety Manager, Grey Coppi
- Delivery Order Manager, John Holwell
- The employer of any injured worker who is not a Foster Wheeler Environmental employee
- Navy ROICC NTR

Written confirmation of verbal reports are to be submitted within 24 hours. The accident/incident report is found in the Foster Wheeler Environmental Corporate Health and Safety Program Manual Section HS 1-7. If the employee involved is not a Foster Wheeler Environmental employee, his employer shall receive a copy of the report.

12.11 Adverse Weather Conditions

In the event of adverse weather conditions, the SHSO or designee will determine if work can continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries
- Potential for cold stress and cold-related injuries
- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds)
- Limited visibility (fog)
- Potential for electrical storms
- Earthquakes and,
- Other major incidents.

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The SHSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

12.12 Spill Control and Response

Refer to the Spill Prevention Control and Counter Measure (SPCC) Plan which is included in the Environmental Protection Plan.

12.13 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on-site. A map showing the location of emergency equipment shall be developed by the SHSO.

- Industrial first aid kit
- Burn kit
- Portable eye washes (one per field team meeting ANSI Z358.1-1991)
- Air horns (one per field team)
- Fire extinguishers (one per trailer/vehicle, trailers and located at hot work stations)
- Fire Blanket
- Stretcher
- Stokes Basket
- CSE Rescue Equipment
- Two-way radios
- Absorbent Material
- Signal Flags
- Traffic Vests

12.14 Postings

The following information shall be posted at various, conspicuous locations throughout the site:

- Emergency telephone numbers
- Diagrams showing the location of fire extinguishers and emergency equipment and,
- Emergency exit, evacuation routes and staging area.

12.15 Restoration and Salvage

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers
- Refilling medical supplies
- Recharging eyewashes and/or showers
- Replenishing spill control supplies and,
- Replacing used air horns

13.0 TRAINING

13.1 General Health and Safety Training

In accordance with Foster Wheeler Environmental corporate policy, and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical).

13.1.1 Three Day Supervised On the Job Training

In addition to the required initial hazardous waste operations training, each employee shall have received three days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

13.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for field work. The training will cover a review of 1910.120 requirements and related company programs and procedures.

13.3 Supervisor Training

The Foster Wheeler Environmental Site Superintendent has taken an eight-hour supervisor training class meeting the requirements of 1910.120(c).

13.4 Site-Specific Training

Prior to commencement of field activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the site and will highlight all provisions contained within this SHSP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

13.5 On-Site Safety Briefings

Project personnel and visitors will be given on-site health and safety briefings prior to the start of each work shift by the Construction Superintendent or Supervisor to assist site personnel in safely conducting their work activities. The briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity for the SHSO to periodically update the workers' air monitoring results. Prior to starting any new activity, a training session using the Activity Hazard Analysis will be held for workers involved in the activity.

13.6 First Aid And CPR

The SHSO will identify those individuals requiring first aid and CPR training in order to ensure that emergency medical treatment is available during field activities. It is expected that a minimum of two field personnel onsite at any one time will have first aid and CPR training. The training will be consistent with the requirements of the American Red Cross Association and include bloodborne pathogens training.

13.7 Hazard Communication

Hazard communication training will be provided in accordance with the requirements contained in the Foster Wheeler Environmental Health and Safety Program Manual, Section 4-2.

13.8 Asbestos Training

The employees of the subcontractor performing asbestos removal shall be trained in accordance with applicable Federal and State regulations.

14.0 LOGS, REPORTS AND RECORDKEEPING

The following is a summary of required health and safety logs, reports and recordkeeping.

14.1 Field Change Request

To be completed for initiating a change to the SHSP. The PHSM and Project Manager or designee approval is required. The original will be kept in the project file. Approved changes will be reviewed with affected field personnel at a safety briefing. Copies will be distributed to the Client Representative.

14.2 Medical and Training Records

Copies or verification of training (40 hour, 8 hour refresher, supervisor, site specific training, respirator fit test, documentation of three day OJT) and medical clearance for hazardous waste site work and respirator use will be maintained onsite. Records for all subcontractor employees will also be kept onsite. All employee medical records will be maintained by the Corporate Medical Consultant - Greaney Medical Group in accordance with Foster Wheeler Environmental Corporation Health and Safety Program Manual, section HS 1-8.

14.3 On-Site Log

A log of personnel on-site each day will be kept by the Project Superintendent or designee.

14.4 Weekly Safety Reports

The SHSO shall complete and submit weekly and monthly health and safety reports to the PHSM. The report is provided in Appendix H.

14.5 Exposure Records

All personal monitoring results, laboratory reports, calculations and air sampling data sheets are part of an employee exposure record. These records will be maintained by the SHSO during site work. At the end of the project they will be maintained according the 29 CFR 1910.20 and Foster Wheeler Environmental Corporation Health and Safety Program Manual, Section HS 1-8.

14.6 Accident/Incident Reports

The incident reporting and investigation during site work will follow Foster Wheeler Environmental Corporation Health and Safety Program Manual, section HS 1-7. Spill reporting and investigation may be recorded on this form.

14.7 OSHA Form 200

An OSHA Form 200 will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to Regional Health and Safety Manager for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA 200 form. The incident report form referenced in section 12.11 meets the requirements of the OSHA Form 101(supplemental record) and must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

14.8 Health and Safety Logbooks

The SHSO will maintain logbooks during site work. The daily site conditions, personnel, monitoring results and significant events will be recorded. The original logbooks will become part of the exposure records file.

14.9 Hazard Communication Program/MSDS

Material Safety Data Sheets (MSDS) will be obtained for applicable substances and included in the site hazard communication file. The hazard communication program will be maintained onsite in accordance with 29 CFR 1910.1200 and Foster Wheeler Environmental Corporation Health and Safety Program Manual Section HS 4-2.

14.10 Work Permits

All work permits, including confined space entry, hot work, lockout/tagout, and line breaking permits will be maintained in the project files.

15.0 FIELD PERSONNEL REVIEW

This form serves as documentation that field personnel have read, or have been informed of, and understand the provisions of the SHSP. It is maintained on site by the SHSO as a project record.

Each field team member shall sign this section after site-specific training is completed and before being permitted to work on site.

I have read, or have been informed of, the Site-Specific Health and Safety Plan for NETC, Tank Farm 4, and understand the information presented. I will comply with the provisions contained therein.

Name (Print and Sign)	*Date*

16.0 REFERENCES

29 CFR 1910.120 Hazardous Waste Operations and Emergency Response. USDOL - OSHA.

Health and Safety Program Manual. Foster Wheeler Environmental Corporation. 1995.

Preliminary Closure Assessment Report of Tank Farms 4 and 5 at Naval Education and Training Center, Newport, Rhode Island, Halliburton NUS, June 1995

APPENDIX A

FIELD CHANGE REQUEST FORM

HASP FIELD CHANGE

Field Change Number: _____ Date Effective: _____

Pen and Ink changes to be made in the HASP to alert the reader of this change:

Reason for the change to be incorporated into the HASP:

TEXT OF CHANGE TO BE INCORPORATED:

FOSTER WHEELER ENVIRONMENTAL
FIELD CHANGE REQUEST FORM

PROJECT:

CHARGE NUMBER:

PROJECT LOCATION:

DESCRIPTION OF CHANGE:

REASON FOR CHANGE:

RECOMMENDED DISPOSITION:

SITE MANAGER:

Signature Date

PROJECT SAFETY AND HEALTH MANAGER:

Signature Date

DISTRIBUTION:

Project Health and Safety Manager _____
Site Health and Safety Officer _____
Quality Assurance Representative _____
Field Operation Leader _____

FIELD CHANGE RECORDS

Record of Field Changes:

Initial for attaching any Field changes to this HASP. Enter the Field Change Number and Date Issued. File the completed field changes to this HASP at the end as attachments. Make PEN and INK changes in the text to alert the reader to the changes that are required in the Field Change.

FIELD CHANGE NUMBER	DATE ENTERED	SYNOPSIS OF CHANGE	INITIAL

APPENDIX B

KEY PERSONNEL RESUMES

Thomas J. Hawthorne

Senior Environmental Scientist/Health and Safety Officer

EXPERIENCE SUMMARY

Environmental Scientist actively involved in health and safety management and field activities for environmental projects including process plant construction, remedial management, air sampling, soil sampling, groundwater sampling, well monitoring and data analysis. Assists the Corporate Health and Safety Manager in corporate health and safety training courses, as well as the Corporate Health and Safety Program. He also conducts environmental audits, site assessments and assists project site activities such as wetlands delineation and construction management services for decontamination/demolition projects.

REGISTRATIONS

MSA - Equipment Certification
Industrial Scientific Equipment Certification
Train the Trainer Certification - HAZWOPER, HAZWOPER Supervisor, HAZWOPER Refresher, HAZCOM, Emergency Response, Confined Space Entry

EDUCATION

B.A., Environmental Urban and Geographic Sciences, Montclair State University - 1984

TRAINING

NIOSH 7400 Asbestos Training
40-Hour OSHA Hazardous Waste Health and Safety Training - 1988
8-Hour OSHA Hazardous Waste Health and Safety Supervisor Training - 1990
8-Hour Hazardous Waste Health and Safety Refresher Course - Current
OSHA Construction Outreach Course
RCRA Training Courses - Parts I, II and III
Confined Space, Entry Training - 29 CFR 1910.120.146
SCBA & Supplied Air Training
Red Cross Certified First Aid, CPR, and Bloodborne Pathogens
Productive Communications Techniques
Interaction Management Training
Hazardous Communication - SARA
Orientations - 29 CFR 1910.120
Emergency Response - 29 CFR 1910.120
Fit Testing - 29 CFR 1910.136

REPRESENTATIVE PROJECT EXPERIENCE

On-site Health and Safety Officer for a $50+ million Superfund project involving uniform capping of a hazardous waste site, installation of a pump and treat system, groundwater control system, and SBR/GWT plant construction. Coordinator for evidence of recovery and characterization of unknown

Thomas J. Hawthorne

drum removal operations at the site. Performs field air sampling and air monitoring. Monitors confined space entries. Developed fall protection and hot work programs for construction activities.

Health and Safety Management for governmental and industrial projects, coordinator for Health and Safety operations management and training programs.

Site Manager and Health and Safety Coordinator for sampling, remediation, and demolition project that involved drum removal fro a pharmaceutical company in the Republic of Ireland.

Responsible for updating the Corporate Health and Safety Program.

Performed mercury remediation for large utility company, involving decontamination and mercury recovery of process vessels and associated equipment. Duties included site supervision and Health and Safety oversight.

Research Project involving the permeation /breakthrough rates for a variety of Personal Protective Equipment (PPE) and developing a PPE program for a major remediation project involving such contaminants as Hydrogen Fluoride and Petroleum Hydrocarbons.

RCRA Compliance/Health and Safety Specialist, coordinating research project involving the transportation, treatment and disposal of large quantities of reactive hazardous waste for fluidized bed pilot plant project.

Assisted in the preparation and field management of Health and Safety for SITE program involving the remediation of landfilled batteries in the State of Alaska.

Site manager for remediation involving decontamination and hazardous waste removal for a metal milling company in the State of New Jersey.

Assisted in the authoring of Health and Safety Plan and safety coordination for a Government landfill project in the State of Virginia, involving monitoring well installation and subsurface investigations, performed in Level D, C and B personal protection.

On-site supervisor and Health and Safety Officer for on-going remediation projects for a major foods manufacturer.

Performed environmental planning operations for reports to be submitted to the State of New Jersey.

Departmental Coordinator for Health and Safety Operations.

Thomas J. Hawthorne

PRIOR EXPERIENCE

New Jersey Hazardous and Solid Waste
Treatment Storage and Disposal Facility (TSDF)

Environmental Services Manager, 1989-1990 - Coordinated all off-site Health and Safety operations and conducted Health and Safety audits of remedial operations. Interviewed prospective technicians, and prepared/administered annual reviews. Coordinated all off-site sampling and remediation projects. Trained technicians in field operations. Developed training programs, training manuals and developed and implemented SOPs for field technicians and services. Also performed environmental audits and inspections and assisted in bid preparations and locating suitable disposal facilities for hazardous and solid wastes.

Assistant Environmental Services Manager, 1988-1989 - Responsible for on-site coordinating for environmental projects. Trained and supervised technicians and subcontractors during field work. Acted as health and safety officer during hazardous waste operations. Functioned as lab pack specialists and technical engineering assistant. Performed field chemical testing of wastes. Researched, analyzed, and classified toxic hazardous wastes.

Environmental Field Technologist/Field Supervisor, 1987 - Performed RCRA and ECRA sampling Supervised technicians during sampling operations. Worked on hazardous waste mitigation projects and field studies. Segregated, packed and manifested hazardous wastes for shipment to TSDF and to final disposal sites. Experienced using SCBA, supplied air, and various liquid and gas sampling equipment.

Supermarket Chain
1978-1987

Held several positions from entry level assignments to customer service/operations manager. Performed site inspections, forecasting analysis and OSHA safety and security audits. Also conducted orientation and training classes.

City of Montclair Planning and Urban Development

Intern Assistant Municipal Planner, 1983-1984 - Performed detailed cartographic work for the municipality. Drafted blueprints using field information for redevelopment plans. Prepared charts, summaries, and reports from maps and raw data for urban renewal projects. Assisted in redevelopment of the City's master plan. Reviewed and evaluated Federal and State Grant proposals. Prepared Field Summaries from site work.

Victoria A. Wilson

Environmental Scientist/Industrial Hygienist

EXPERIENCE SUMMARY

One year of experience in occupational health and safety at hazardous waste sites, construction/remediation operations and industrial facilities. As a Health and Safety Officer, responsible for air sampling using personnel pumps and direct reading instruments; utilization of various levels of personal protective equipment; and implementation of the site-specific health and safety plan (HASP). Other duties include the preparation of HASPs, worker training programs and knowledge of OSHA regulations.

REGISTRATIONS

Certified in Hazardous Materials, Level I, Awareness and Hazardous Materials, Level II Operational, State of New Jersey

EDUCATION

M.S., Environmental Science, New Jersey Institute of Technology, emphasis on Toxic Chemical Management, Newark, NJ - 1994

B.S., Environmental Science, Major Pollution and Occupational Health, Cook College, Rutgers University, New Brunswick, NJ - 1992

Related Courses: Environmental Pollution, Air Pollution Quality, Environment and Health, Environmental Health Epidemiology, Microbiology, Chemistry, Industrial Safety, Environmental Ecology, Water and Wastewater Treatment, Environmental Impact Statement, Public Health Administration, Air Sampling Gas Analysis, Hazardous Wastes, Principles of Industrial Hygiene, Special Problems in Environmental Health and their respective laboratory classes.

TRAINING

40-Hour OSHA Hazardous Waste Health and Safety Training - 1994
8-Hour OSHA Hazardous Waste Health and Safety Supervisor Training - 1995
8-Hour OSHA Hazardous Waste Health and Safety Refresher Course - Current
American Red Cross, CPR - 1995
American Red Cross, First Aid - 1995
Det Norske Veritas Loss Control Management Self Study Program - 1995

REPRESENTATIVE PROJECT EXPERIENCE

MacGregor, TX, Field Sampler/Project Engineer - Performed sample collection, management, data analysis, and report preparation. Sample media included soil, limestone, wipe, and QA/QC samples. Responsible for developing, implementing, and enforcing the site-specific health and safety plan and applicable state and federal regulations. Performed on-site health and safety management of remediation activities at active warehouse facility.

Chevron Chemical, Former Millmaster Onyx Site, Berkeley Heights, NJ, Assistant Health and Safety Officer - Responsible for health and safety at this large remediation project. Duties included performing

Victoria A. Wilson

real-time air monitoring, collection of personal samples for compliance with OSHA standards, use of Level C and B respiratory protection, heat stress monitoring, employee training, and loss control audit programs. Conducting weekly and monthly health and safety inspections in accordance with corporate program requirements. Site activities included building construction; trenching/excavation; drum excavation and sampling; installation of groundwater treatment system; and a RCRA cap.

Allied-Sumitomo, Teterboro, NJ - Provided health and safety oversight of excavation and drilling activities. Duties included performing real-time radiological and volatile organic air monitoring, interpretation of data, conducting daily safety briefings, and employee training.

Lyndhurst Office, Lyndhurst, NJ, Industrial Hygienist - Responsibilities include development and implementation of site- specific health and safety plans at various project sites. Duties include conducting site-specific training, real-time and personal air monitoring, use of respiratory protection and emergency preparedness, and participate in office health and safety inspections and ergonomic surveys. Also, an instructor for corporate health and safety training programs.

PRIOR EXPERIENCE

Edison Health Department
Edison, NJ

Internship, 1991 - Worked along with licensed sanitarians performing inspections, writing reports, summonses, court cases, and maintained accurate logs. Conducted air and noise monitoring and dosimetry.

Respond Medical Services
Perth Amboy, NJ

Emergency Medical Technician, 1987-1989 - Performed patient transfers.

1986-Present - Old Bridge Ambulance and Emergency Squad. Volunteer for ten years, volunteering at least 96 hours per month, crew leader and treasurer. Life member status.

Grey P. Coppi, CIH

Health and Safety Supervisor

EXPERIENCE SUMMARY

Certified Industrial Hygienist and a Certified Safety Professional with over 11 years of technical and managerial experience in occupational health and safety.

Background includes experience with a Federal regulatory agency that involved health and safety standard applications and enforcement in the manufacturing, chemical, construction and maritime industries. Additional private sector experience has included performing site audits, training course development and presentations and written health and safety program creation. Areas of expertise include Health and Safety Plan preparation and implementation, site auditing and air monitoring methods and applications.

Joined Foster Wheeler Environmental Corporation in September 1995, and was assigned to the five-year, $250 million US Navy Northern Division Remedial Action Contract Program to provide health and safety support for contracts awarded within this region. Also responsible for supporting the administration of the Foster Wheeler Environmental internal Health and Safety Program.

Provided technical and site support to over 100 projects that involved the USACE, USDOE and commercial clients. Project activities included, soil and groundwater sampling, test pit excavations, well installations, soil excavation, in-situ treatment of soil and water, stabilization, landfill capping, drum removal and sampling and groundwater pump and treat plant construction. Contaminants included PCB's, metals, VOC's, dioxins and pesticides.

REGISTRATIONS

Certified Industrial Hygienist (CIH), #5279 - 1991
Certified Safety Professional (CSP), #11120 - 1992
Certified Hazard Control Manager (CHCM), #2379 - 1992

EDUCATION

M.S., Environmental Health Science, City University of New York, Hunter College - 1986
B.S., Health Science, City University of New York, Brooklyn College - 1980

TRAINING

40-Hour OSHA Health and Safety Hazardous Waste Training - 1988
8-Hour OSHA Health and Safety Hazardous Waste Supervisory Training - 1991, 1993, 1995
8-Hour OSHA Health and Safety Hazardous Waste Refresher - Current
Red Cross First Aid and CPR - 1994
Confined Space Entry - 1988, 1993

Grey P. Coppi, CIH

REPRESENTATIVE PROJECT EXPERIENCE

Provided technical, managerial and leadership oversight to the New Jersey Turnpike Authority (NJTA) during their $500,000,000 roadway widening program that involved the excavation, segregation and placement of soil contaminated with lead and VOC's. Responsible for assessing compliance with Contractual specifications for 13 separate contracts. Specific duties included the approval of all on-site health and safety personnel (25) employed by the construction contractors; performed site audits and assessments, and developed an audit checklist and communicated results and recommendations to contractors and the NJTA; provided oral and written correspondence to NJTA, environmental firms, contractor's and section engineers, evaluated air monitoring data and maintained training records.

Provided project health, safety and environmental support to a construction firm who was involved in a $10,000,000 plus addition to an existing NYC waste water pollution control plant located on Wards Island, NYC. Wrote the HASP, supervised the on-site health and safety officer and performed bi-weekly site audits to assess compliance with the Contract Specifications and with the site-specific HASP.

Functioned as the full-time on-site Health and Safety Officer for a $15,000,000 residential remediation located in Northern New Jersey. Over the years, soil had become contaminated with lead and mercury from a nearby explosives manufacturing plant. This project involved the excavation, transportation and disposal of 100,000 tons of soil, backfilling and restoration of lawns, walkways, garages, decks, etc. Duties involved ensuring adherence with the HASP, maintenance of training, air, medical and biological monitoring records; provided training to all personnel; supervised and implemented perimeter and personal air monitoring strategies for dust, lead and mercury. Interfaced with client, NJDEP and oversight engineer.

Functioned as the on-site CIH for a $12,000,000 plus project for a construction contractor who was tasked with capping a municipal landfill located in Westchester, New York. The 65- acre site activities included clearing and grubbing, swale construction, regrading, leachate and methane gas collection systems and monitoring well construction and installation. Potential on-site hazards included methane gas, VOC's and ionizing radiation.

Functioned as Eastern Division Industrial Hygienist for a large hazardous waste remedial firm. Oversaw projects that included remediation of PCB containing soils for three New Jersey compressor stations belonging to a natural gas pipeline transmission company; remediation of soil containing mercury and lead at a New Jersey explosives facility complying with an ACO agreement; remediation of ponds and lagoons containing VOC's at a fragrance manufacturer located in New Jersey; performed weekly site visits for a building demolition and UST removal for a chemical manufacturer located in New Jersey; functioned as health and safety officer for a building decon (mercury) of piping, ladders, walkways and for the excavation and removal of soil and AST decommissioning; responsible for health and safety operations for a USACE cleanup and capping for a $20,000,000 municipal landfill located in Pennsylvania; responsible for health and safety operations for the construction and closure of a TSD landfill located in Ohio; responsible for chemical and township sewer cleanup (Buffalo, NY) contaminated with mercury and dioxin; and a number of sites contaminated with herbicides and insecticides were remediated.

David N. Dougherty
122 Linden St.
West Chester, Pa. 19380
(610) 431-2590

OBJECTIVE: To utilize my work experience, increase my knowledge and improve my effectiveness in an effort to benefit my employer.

EDUCATION:

June 1987 — West Chester East High, West Chester, Pa.

Sept. 1988 to Dec. 1988 — North Greenville College, Tigerville, SC. General Assoc. of Sciences courses

WORK HISTORY:

Nov. 1992 to Present — **FOSTER WHEELER ENVIRONMENTAL CORP.,** B.R.O.S SITE
Assistant Health & Safety Scientist
* Real time & time weighted air monitoring for site operations including waste lagoon excavation, backfill, thermal destruction unit operation & maintenance, drum removal & drum sampling.
* Employee training for, and air monitoring of, confined space activity.
* Inspection to ensure compliance with all applicable regulations involving construction & HAZ\MAT operations.

Jan. 1992 to Nov. 1992 — **EBASCO CONSTRUCTORS INC.,** B.R.O.S. SITE
Administrative assistant
* Responsible for all daily and weekly reporting.
* Responsible for site medical surveillance program.
* Responsible for all regulatory compliance training.

March 1991 to Dec. 1991 — **SMITH AND WOLF PAINTING**
Painter
* Painted interiors and exteriors of custom homes.

Aug. 1990 to March 1991 — **RUBERTI'S**
Machine operator
* Applied labels, stitching, numbers and letters to athletic sportswear.

March 1990 to Aug. 1990 — **A & B CLEANERS**
Buffer
* Operated a floor buffer for commercial and residential property.

April 1989 to Feb. 1990 and Aug. 1987 to Aug. 1988

MID-ATLANTIC TECHNICAL SERVICES

Field Technician

* Oversaw the quality control for the demolition and reconstruction of a bulkhead (sea wall) for a local chemical plant.
* Responsible for all documentation and reporting for the bulkhead project.

CURRENT CERTIFICATIONS:

* American Red Cross ~~community first aid~~ & CPR.
* OSHA 29 CFR 1910.120, 40-hr. training for HAZ\MAT operations.
* OSHA 29 CFR 1910.120, 8-hr. supervisors refresher for HAZ\MAT operations.
* Level III trained for inspection & maintenance of MSA supplied air respirators.
* Asbestos project inspector. City of Philadelphia.
* State of Pennsylvania asbestos supervisor.

APPENDIX C

ACTIVITY HAZARD ANALYSES

ACTIVITY HAZARD ANALYSIS

Project: TANK FARM 4 CLOSURE, NETC - NEWPORT
Location: NEWPORT, RI
Activity. MOBILIZATION

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1 Preparation of work area. (Hazards 1-9apply) 2 Transportation of equipment and delivery of materials (Hazards 1-5 apply) 3. Construction of decontamination pad (Hazards 1-8 apply)	1. Back Injuries 2. Slips/Trips/Falls 3. Pinch/Cut/Smash 4. Vehicular Traffic 5. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against) 6. Noise 7. Electrocution 8. Fire 9. Cuts, bits from thickets and insects	1. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available, Instruct personnel on proper lifting techniques 2 Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards. 3 Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition, guards will be kept in place while using hand and power tools 4. Spotters will be used when backing up trucks and moving equipment 5. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads, all slings chains and ropes will be rated for the load in which it is expected to lift, spills and absorbent materials will be readily available, drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms. 6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers 7. Ground fault circuit interrupters will be used, cords will be kept off of and out of wet areas unless they are approved submersible type; cords will be inspected prior to use, damaged equipment will be tagged and taken out of service. 8. Smoking will not be allowed in work area; 10-lb. ABC type fire extinguishers shall be readily available. 9. Wear white Tyvek; utilize buddy system to check for ticks. Apply repellent.
EQUIPMENT USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
1. Hand and Power Tools 2. Level D PPE 3. First Aid Kits 4. GFCIs and Extension Cords 5. Portable Eyewash 6. Fire Extinguishers 7. Heavy equipment	1. Initial inspections will be required prior to use of hand and power tools. 2. Monthly inspections will be performed on fire extinguishers 3. Daily safety and weekly inspections will be performed on first aid kits. 4. Extension cords will be inspected prior to each use. 5. Heavy equipment will be inspected prior to each use. 6. Portable eye wash will be inspected monthly. 7. GFCIs will be inspected monthly.	1. Personnel have read and comply with SHERP 2. Site specific training 3. Qualified operators will be used for heavy equipment operation 4. Instruct personnel on proper use of fire extinguishers 5. At least 2 individuals on-site will have current CPR and First aid training 6 Personnel will be trained to use power tools safely 7. Personnel will be trained on proper use of extension cords

ACTIVITY HAZARD ANALYSIS

Project: TANK FARM 4 CLOSURE, NETC - NEWPORT
Location: NEWPORT, RI
Activity: WATER TREATMENT PLANT CONSTRUCTION AND OPERATION

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Water Treatment Plant Construction (Hazards 1-8 apply) 2. Water Treatment Plant Operation (Hazards 1-3, 6-10 apply)	1. Back Injuries 2. Slips/Trips/Falls 3. Pinch/Cut/Smash 4. Vehicular Traffic 5. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against) 6. Noise 7. Electrocution 8. Fire 9. Eye injuries 10. Chemical Exposure to H2S and/or TPH	1 Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques. 2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards 3 Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition; guards will be kept in place while using hand and power tools 4 Spotters will be used when backing up trucks and moving equipment 5 Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations, equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides, avoid equipment swing areas, know hand signals; all equipment will be equipped with backup alarms 6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers 7 Ground fault circuit interrupters will be used; cords will be kept off and out of wet areas unless they are approved submersible type; cords will be inspected prior to use; damaged equipment will be tagged and taken out of service 8. Smoking will not be allowed in work area; 10-lb. ABC type fire extinguishers shall be readily available 9. Safety glasses meeting ANSI Standard Z87 will be worn, portable eye wash station will be located by the work area 10. Protective clothing will be worn during treatment plant operations; skin will be rinsed with water if contact with hazardous materials occurs. Air monitoring will be performed per SHSP.

EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Hand and Power Tools 2. Personal Protective Equipment 3. First Aid Kits 4. GFCIs and Extension Cords 5. Portable Eyewash 6. Fire Extinguishers 7. Heavy equipment	1. Initial inspections will be required prior to use of hand and power tools. 2. Monthly inspections will be performed on fire extinguishers. 3. Daily safety and weekly inspections will be performed on first aid kits. 4. Extension cords will be inspected prior to each use. 5. Heavy equipment will be inspected prior to each use. 6. Portable eye wash will be inspected monthly. 7. GFCIs will be inspected monthly.	1. Personnel have read and comply with SHERP 2. Site specific training 3. Qualified operators will be used for heavy equipment operation 4. Instruct personnel on proper use of fire extinguishers 5. At least 2 individuals on-site will have current CPR and First aid training 6. Personnel will be trained to use power tools safely 7. Personnel will be trained on proper use of extension cords

ACTIVITY HAZARD ANALYSIS

Project: TANK FARM 4 CLOSURE, NETC - NEWPORT
Location. NEWPORT, RI
Activity: TANK CLEANING AND REPAIR

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Pump Room Preparation(Hazards 1-8 apply) 2. Tank Cleaning (Hazards 1-8 apply) 3 Tank Repair (Hazards 1-8 apply)	1. Confined Space 2. Electrocution 3. Chemical Exposure to TPH, CO,H2S, VC, Benzene 4. Back Injuries 5. Slips/Trips/Falls 6. Pinch/Cut/Smash 7. Noise 8. Fire/Explosion	1. All confined space entries will be conducted in compliance with Foster Wheeler Corporate Health and Safety Program Manual Section 6-2 2 Ground fault circuit interrupters will be used; cords will be kept off of and out of wet areas unless they are approved submersible type; cords will be inspected prior to use; damaged equipment will be tagged and taken out of service. Use I.S. equipment. 3. Protective clothing will be worn. Level C or B, per form indicated air monitoring. Continuously ventilate each tank. 4. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques. 5. Maintain work areas safe and orderly. Use scaffolds and secure to tank 6 Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition, guards will be kept in place while using hand and power tools 7. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers 8. Smoking will not be allowed in work area; 10-lb. ABC type fire extinguishers shall be readily available. Intrinsically safe and/or explosion proof equipment and radios will be used during tank operations Use spark resistant tools, if available. Continuously ventilate each tank.
EQUIPMENT USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
1. Pressure washers 2. Personal Protective Equipment 3. First Aid Kits 4. Pumps 5 Portable Eyewash 6. Manlift, scaffolding 7. Vacuum 8. Air Monitoring equipment 9. Rescue equipment for confined space	1. Pressure washers will be inspected prior to each use. 2. Monthly inspections will be performed on fire extinguishers. 3. Daily safety and weekly inspections will be performed on first aid kits. 4. Pumps, vacuum and sampling equipment will be inspected prior to each use. 5. Manlift and scaffolding will be inspected prior to each use. 6. Portable eye wash will be inspected monthly. 7. Monitoring equipment will be calibrated and inspected daily.	1. Personnel have read and comply with SHERP 2. Site specific training 3. Qualified operators will be used for heavy equipment operation 4. Instruct personnel on proper use of fire extinguishers 5. At least 2 individuals on-site will have current CPR and First aid training 6 Personnel will be trained to use of pressure washers 7 Only personnel trained in confined space entry will be allowed in the tanks

ACTIVITY HAZARD ANALYSIS

Project: TANK FARM 4 CLOSURE, NETC - NEWPORT
Location: NEWPORT, RI
Activity. PIPE REMOVAL

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Excavation/Pipe Exposure (Hazards 1-10 apply) 2. Asbestos Removal (Hazards 8, 10 apply) 3. Pipe Removal (Hazards 1-10 apply) 4. Backfill (Hazards 1-7 apply) 5. Screening of Excavated Material (Hazard 7, 10 apply)	1. Back Injuries 2. Slips/Trips/Falls 3. Pinch/Cut/Smash 4. Vehicular Traffic 5. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against) 6. Noise 7. Fire 8. Excavation/Trenching 9. Asbestos Exposure 10. TPH Exposure	1. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques. 2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards. 3 Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition, guards will be kept in place while using hand and power tools. Wear chaps and full face shield for saws. 4. Spotters will be used when backing up trucks and moving equipment 5. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift, spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms 6 Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs), SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers 7. Smoking will not be allowed in work area; 10-lb ABC type fire extinguishers shall be readily available 8. All excavation and trenching activities will be conducted in accordance with the Foster Wheeler Corporate Health and Safety Program Manual Section 6-4 9. Wear appropriate PPE and respiratory protection; conduct air montioring for asbestos; wet down with HEPA vacuum 10. Wear appropriate PPE; perform air monitoring; use vapor suppression foam

EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Hand and Power Tools 2. Level D PPE 3. First Aid Kits 4. GFCIs and Extension Cords 5. Portable Eyewash 6. Fire Extinguishers 7. Heavy equipment 8. Shears/saw	1. Initial inspections will be required prior to use of hand and power tools. 2. Monthly inspections will be performed on fire extinguishers. 3. Daily safety and weekly inspections will be performed on first aid kits. 4. Extension cords will be inspected prior to each use. 5. Heavy equipment will be inspected prior to each use. 6. Portable eye wash will be inspected monthly. 7. GFCIs will be inspected monthly.	1. Personnel have read and comply with SHERP 2. Site specific training 3. Qualified operators will be used for heavy equipment operation 4. Instruct personnel on proper use of fire extinguishers 5 At least 2 individuals on-site will have current CPR and First aid training 6 Personnel will be trained to use power tools safely 7. Personnel will be trained on proper use of extension cords

ACTIVITY HAZARD ANALYSIS

Project: TANK FARM 4 CLOSURE, NETC - NEWPORT
Activity: SITE RESTORATION AND DEMOBILIZATION
Location. NEWPORT, RI

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Backfill and Compaction of Excavated Areas (Hazards 1-8 apply) 2. Hydroseeding of Disturbed Areas (Hazards 1-3, 6 apply) 3. Disconnect Utilities (Hazards 1-4, 6-8 apply) 4. Remove Trailers and Equipment (Hazards 1-8 apply)	1. Back Injuries 2. Slips/Trips/Falls 3. Pinch/Cut/Smash 4. Vehicular Traffic 5. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against) 6. Noise 7. Electrocution 8. Fire	1 Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques. 2 Maintain work areas safe and orderly; unloading areas should be on even terrain, mark and repair if possible tripping hazards 3 Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition, guards will be kept in place while using hand and power tools 4 Spotters will be used when backing up trucks and moving equipment 5 Equipment will have rollover protective structures and seat belts, operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects, ground personnel will stay clear of all suspended loads, all slings chains and ropes will be rated for the load in which it is expected to lift, spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment, eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides, avoid equipment swing areas, know hand signals; all equipment will be equipped with backup alarms 6 Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs), SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers 7. Ground fault circuit interrupters will be used, cords will be kept off of and out of wet areas unless they are approved submersible type; cords will be inspected prior to use; damaged equipment will be tagged and taken out of service 8. Smoking will not be allowed in work area; 10-lb. ABC type fire extinguishers shall be readily available
EQUIPMENT USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
1. Hand and Power Tools 2. Personal Protective Equipment 3. First Aid Kits 4. GFCIs and Extension Cords 5. Portable Eyewash 6. Fire Extinguishers 7. Heavy equipment	1. Initial inspections will be required prior to use of hand and power tools. 2. Monthly inspections will be performed on fire extinguishers. 3. Daily safety and weekly inspections will be performed on first aid kits. 4. Extension cords will be inspected prior to each use. 5. Heavy equipment will be inspected prior to each use. 6. Portable eye wash will be inspected monthly. 7. GFCIs will be inspected monthly.	1 Personnel have read and comply with SHERP 2 Site specific training 3 Qualified operators will be used for heavy equipment operation 4 Instruct personnel on proper use of fire extinguishers 5 At least 2 individuals on-site will have current CPR and First aid training 6 Personnel will be trained to use power tools safely 7 Personnel will be trained on proper use of extension cords

ACTIVITY HAZARD ANALYSIS

Project: TANK FARM 4 CLOSURE, NETC - NEWPORT
Location: NEWPORT, RI
Activity: DECONTAMINATE EQUIPMENT AND SUPPLIES

MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Decontaminate equipment utilizing high pressure water (Hazards 1-9 apply)	1. Eye Injuries 2. Struck By (water stream) 3. Chemical Exposure 4. Heat Stress 5. Noise 6. Slips/Trips/Falls 7. Back Injuries 8. Vehicular Traffic 9. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)	1 Chemical goggles and full-faced shield meeting ANSI Standard Z87 will be worn; portable eye wash will be located by the work area. 2 Proper instruction on safe use of pressure washers will be conducted, operators will not fix the hand trigger in the open position such that if the wand were left unattended, water would spray from the tip; all pressure washers will be equipped with a deadman switch; pressure washerswill not be left running unattended, pressure hoses will be inspected prior to use 3. Protective clothing (Tyvek, inner surgical gloves, outer nitrile gloves, splash shields, safety goggles and chemical boots) will be worn for pressure washing; skin will be rinsed with water if contact with hazardous materials occurs; Safety glasses, chemical boots and gloves are only required for collecting and sampling washwater; SHSO will determine if additional PPE is required based on splash hazard 4 Work/rest regimes for workers in permeable clothing will be instituted in accordance with ACGIH TLVs, Heat Stress monitoring will be conducted in accordance with Foster Wheeler Corporate Health and Safety Program Manual 5 Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection, all equipment will be equipped with manufacturer's required mufflers 6 Tripping and poor footing hazards will be repaired as they are discovered or clearly identified, wet surfaces will be marked and identified 7 Site personnel will be instructed on proper lifting techniques, Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available, Instruct personnel on proper lifting techniques 8 Spotters will be used when backing up trucks and moving equipment 9 Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment, do not operate equipment on grades which exceed manufacturer's recommendations, equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals, all equipment will be equipped with backup alarms

EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1 Pressure Washers 2. Modified Level D PPE 3. First Aid Kits . 4. Pumps and Sampling Equipment 5 Portable Eyewash 6 Heavy equipment	1. Pressure washers will be inspected prior to each use. 2. Monthly inspections will be performed on fire extinguishers 3. Daily safety and weekly inspections will be performed on first aid kits. 4. Pumps and sampling equipment will be inspected prior to each use. 5. Heavy equipment will be inspected prior to each use. 6. Portable eye wash will be inspected monthly. 7. GFCIs will be inspected monthly.	1 Personnel have read and comply with SHERP 2 Site specific training 3. Qualified operators will be used for heavy equipment operation 4 Instruct personnel on proper use of fire extinguishers 5 At least 2 individuals on-site will have current CPR and First aid training 6. Personnel will be trained to use of pressure washers

APPENDIX D

PPE SELECTION FORM

Foster Wheeler Environmental Corporation

PERSONAL PROTECTIVE EQUIPMENT SELECTION

ACTIVITY:_____

TASK	HEAD	EYE/FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR

APPENDIX E

MEDICAL DATA SHEET

Foster Wheeler Environmental Corporation
Navy RAC - NETC Tank Farm 4

MEDICAL DATA SHEET

The brief medical data sheet shall be completed by all on-site personnel and will be kept in the Support Zone by the HSO as a project record during the conduct of site operations. It accompanies any personnel when medical assistance is needed or if transport to a hospital is required.

Project: _____

Name: _____ Home Telephone: _____

Address: _____

Age: _____ Height: _____ Weight: _____ Blood Type: _____

Name and Telephone Number of Emergency Contact: _____

_____

Drug or Other Allergies: _____

Particular Sensitivities: _____

Do You Wear Contacts? _____

Provide A Check List Of Previous Illnesses: _____

_____

_____

_____

What Medications Are You Presently Using? _____

_____

_____

Do You Have Any Medical Restrictions? _____

_____

Name, Address, And Phone Number Of Personal Physician: _____

_____

_____

APPENDIX F

GENERAL HEALTH AND SAFETY WORK RULES

FOSTER WHEELER ENVIRONMENTAL CORPORATION

GENERAL HEALTH AND SAFETY WORK RULES

1. All site personnel must attend each day's Health and Safety Briefing.

2. Any individual taking prescribed drugs shall inform the HSO of the type of medication. The HSO will review the matter with the Project Health and Safety Manager and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on-site while taking the medication.

3. The personal protective equipment specified by the HSO and the HASP shall be worn by all site personnel. This includes hard hats and safety glasses which must be worn at all times in active work areas.

4. Facial hair (beards, long sideburns or mustaches) which may interfere with a satisfactory fit of a respirator mask is not allowed on any person who may be required to wear a respirator.

5. All personnel must sign the site log and the exclusion zone log when used at the site.

6. Personnel must follow proper decontamination procedures and shower at the end of the work shift.

7. Eating, drinking, chewing tobacco or gum, smoking and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in the exclusion zone or the contamination reduction zone. (Exceptions may be permitted by the PHSM to allow fluid intake during heat stress conditions.)

8. All lighters, matches, cigarettes and other forms of tobacco are prohibited in the Exclusion Zone.

9. All signs and demarcations shall be followed. Such signs and demarcation shall not be removed except as authorized by the HSO.

10. No one shall enter a permit-required confined space without a permit. Confined space entry permits must be followed as issued.

11. All personnel must follow Hot Work Permits as issued.

12. All personnel must use the Buddy System in the Exclusion Zone.

13. All personnel must follow the work-rest regimens and other practices required by the heat stress program.

14. All personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.

15, No person shall operate equipment unless trained and authorized.

16. No one may enter an excavation greater than four feet deep unless authorized by the Competent Person. Excavations must be sloped or shored properly. Safe means of access and egress from excavations must be maintained.

17. Ladders and scaffolds shall be solidly constructed, in good working condition and inspected prior to use. No one may use defective ladders or scaffolds.

18. Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.

19. Safety belts, harnesses and lanyards must be selected by the Supervisor. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.

20. Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.

21. Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out walkways and puddles unless protected and rated for the service.

22. Improper use, mishandling or tampering with health and safety equipment and samples is prohibited.

23. Horseplay of any kind is prohibited.

24. Possession or use of alcoholic beverages, controlled substances or firearms on any site is forbidden.

25. All accidents, no matter how minor must be reported immediately to the Supervisor.

26. All personnel shall be familiar with the Site Emergency Response Plan.

The above Health and Safety Rules are not all inclusive and it is your responsibility to comply with all regulations set forth by OSHA, the FWENC Corporate H&S Manual, the HASP, the client, FWENC Supervisors and the HSO.

APPENDIX G

EQUIPMENT DECONTAMINATION FORM

FOSTER WHEELER ENVIRONMENTAL CORPORATION
NAVY RAC DELIVERY ORDER #0013
NETC TANK FARM 4
DECONTAMINATION CERTIFICATE

EQUIPMENT ID: _____

_____

_____

To Navy ROICC:

The above referenced equipment was decontaminated on (Date: _____)

Very truly yours,

_____
FWENC Representative

Comments: _____

_____

_____

APPENDIX H

WEEKLY REPORT

FOSTER WHEELER ENVIRONMENTAL CORPORATION
NORTHERN DIVISION - NAVY RAC
NETC - TANK FARM 4
WEEKLY HEALTH AND SAFETY REPORT

Project Name: _____

Location: _____

SITE INFORMATION

Week Ending _____

Hours Worked _____

Level of Protection B___ C___ D__

INJURIES AND ILLNESSES

Yes_____ No_____

Describe and attach reports:

_____

_____

MAJOR ACTIVITIES CONDUCTED THIS WEEK:

(drum handling, sampling, excavation, abatement/T&D, etc.)

_____

_____

_____

SIGNIFICANT EVENTS THIS WEEK:

(regulatory visits, equipment malfunctions, process start-up or shutdown):

_____

_____

_____

FUTURE ISSUES:

(schedule, manpower allocation, monitoring equipment, other resources needed)

_____

_____

_____

_____

_____

_____

_____

SITE AUDIT/INSPECTIONS CONDUCTED Yes _____ No _____

(describe outstanding findings and attach results)

_____

_____

_____

_____

_____

AIR MONITORING:
Real Time

Major Activity	Location(s)	Worker Occupation	FID/PID Range	CGI/02 Range	PDM Range	Other

PERSONAL AIR MONITORING

Analyte	Activity Monitored	Occupation	Location	Result	Type of Sample

SUBCONTRACTORS ON SITE

Company Name	Task or Function	Return to Site Next Week (Y/N)

Health and Safety Officer - Signature

Date

ATTACHMENT A

UNITED STATES DEPARTMENT OF THE NAVY NO. N62472-94-D-0398
DELIVERY ORDER No. 013
REMEDIAL ACTION CONTRACT

STATEMENT OF WORK
FOR
WASTEWATER TREATMENT SYSTEM OPERATION
TANK FARM 4
NAVAL EDUCATION AND TRAINING CENTER (NETC)
Newport, Rhode Island

SOW-1284-13-11

April 1996

Prepared By:

Foster Wheeler Environmental Corporation
470 Atlantic Avenue
Boston, MA 02210

Package Status	Date	Prepared By	Approved By	Pages Affected
Rev. 0	4/15/96	J. Brinkman for K. Shah	M. Zizza	

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 GENERAL DESCRIPTION

1.1 Purpose

This Statement of Work (SOW) provides the subcontractor with a description of the equipment and services required to treat wastewaters generated as a result of remedial activities conducted by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) at the U.S. Navy Northern Division (Navy) Naval Education and Training Center (NETC) Tank Farm 4 located in Portsmouth, Rhode Island (the Site). All work for this SOW will be performed under the technical direction of Foster Wheeler Environmental.

1.2 Site Location

The Site is located approximately 25 miles southeast of Providence, Rhode Island in the town of Portsmouth, Rhode Island (Newport County) as shown in Figure 1-1. The Defense Highway is to the north/northwest of the site, Narragansett Bay is located 500 to 1,000 feet to the west and Norman's Brook is located in the southwest corner of the Site. A residential area is located to the southeast of the Site and undeveloped woodlands are located north/northeast of Tank Farm 4. Located to the south and to the north are NETC Tank Farm 5 and Tank Farm 3, respectively. Refer to Figure 1-2 for the site layout.

1.3 Project Description

The NETC Tank Farm 4 consists of approximately 90 acres of open land containing 12 large reinforced concrete underground storage tanks (USTs) owned and controlled by the Navy. Tank Farm 4 is located approximately 20 to 111 feet above sea level. The tank farm was constructed by the Navy in 1941 and was used to store liquid petroleum products. However, the USTs have not been in use since the 1970's.
In 1992, the State of Rhode Island enacted UST regulations and therefore the USTs at NETC Tank Farm 4 became subject to these closure requirements. The Navy initiated the process for permanent closure of the USTs, and in 1996, Foster Wheeler Environmental was selected as the Contractor to complete the closure of the USTs in Tank Farm 4. Closure activities will include removal of all contents from the USTs, and cleaning and repairing the USTs. The contaminants of concern at Tank Farm 4 are those associated with petroleum based products and asbestos pipe insulation.

Other on-site structures include a decommissioned electrical substation, and an oil-water separator. A paved access road leads into the site and loops around the site providing access to the USTs. The outer perimeter of the Site is covered with dense brush and is heavily wooded. A perimeter fence surrounds the site along three (3) sides and most of the Site is covered with tall grass, dense brush and small diameter trees.

1.4 Definitions

1.4.1 The Term "Subcontractor"

The term "Subcontractor" shall mean the person, persons, partnership, corporation, or business organization engaged on behalf of Foster Wheeler Environmental pursuant to a contract for performance of work described in this SOW.

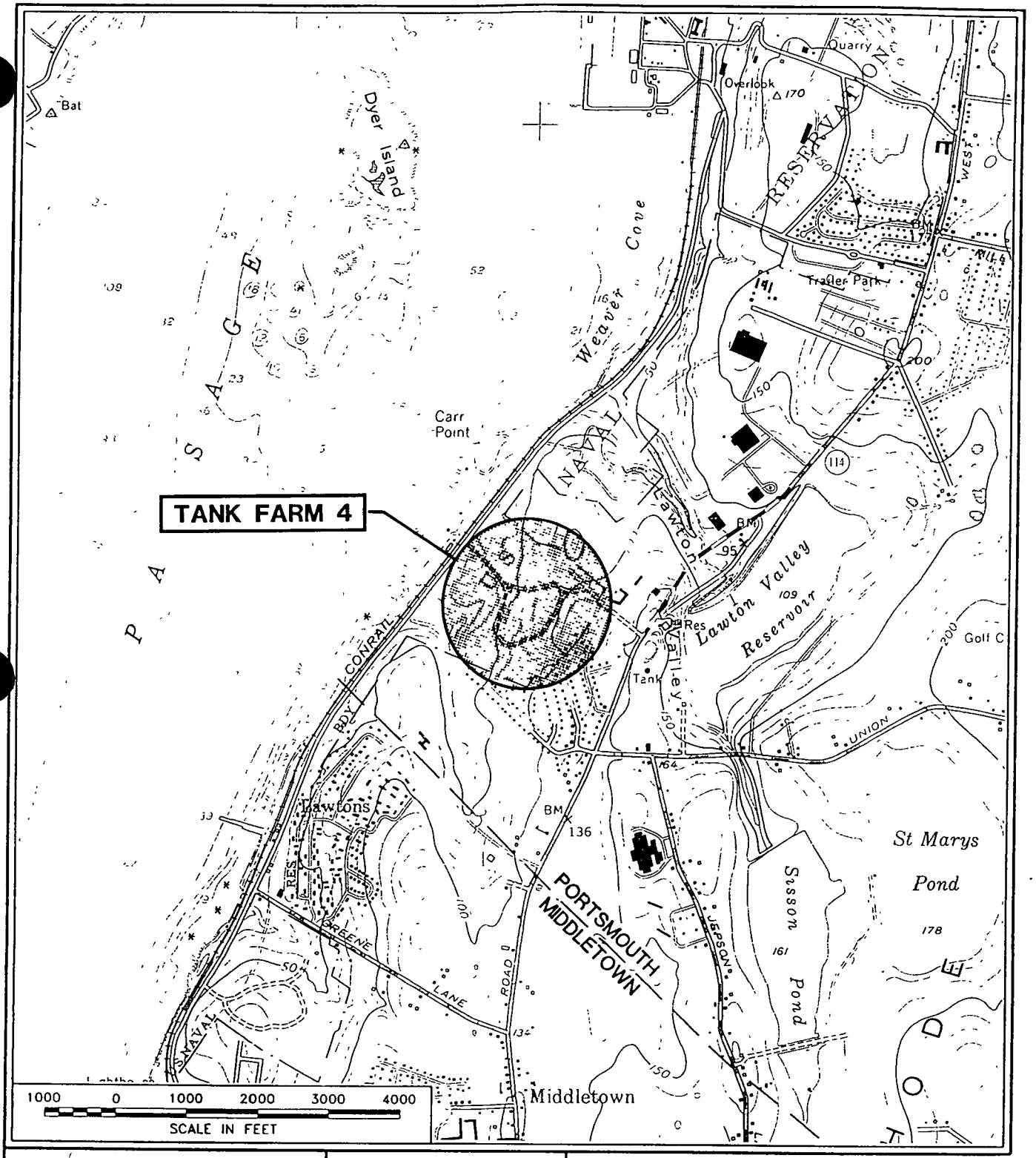


FIGURE 1-1

Naval Education and Training Center
Newport, Rhode Island

SITE LOCATION MAP

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE 1284FG11 DWG

REVISION				
SYM	ZONE	DESCRIPTION	DATE	APPROVED

N

LEGEND

- BUILDING OR STRUCTURE
- ROAD OR PAVED AREA
- TRAIL OR EARTH ROAD
- PROPERTY BOUNDRY & FENCE LINE
- FENCE
- NAVY PROPERTY BOUNDRY LINE
- CONSERVATION BOUNDRY
- RAILROAD
- STREAM
- SHORE LINE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- DEPRESSION CONTOUR
- 14 SPOT GRADE ELEVATION ON SPOT
- WOODED AREA
- MARSH LAND

NOTES:
1. LOCATION OF EQUIPMENT MAY BE FIELD ADJUSTED AS NECESSARY
2. GRAVEL ACCESS ROAD WILL BE LOCATED IN THE FIELD

UNDERGROUND STORAGE TANKS (TYPICAL)

SEE DETAIL 1 THIS SHEET FOR TYPICAL EQUIPMENT LAYOUT AT EACH TANK

NORMANS BROOK

CONTAMINATED SOIL STORAGE (50' x 50')

CHAMBER (TYPICAL)

EQUIPMENT DECONTAMINATION AREA (20' x 60')

ROLL-OFF

DRUM STORAGE (20' x 20')

FRAC TANKS

TOILET FACILITIES

PERSONNEL DECONTAMINATION TRAILER (12' x 60')

WATER TREATMENT FACILITY (60' x 100')

500kVA TRANSFORMER

SHUNT/LOOP PIPING

BURIED PIPE

BURNING PIT

LUNCH/OFFICE TRAILER (12' x 60')

TOILET FACILITIES

ADMINISTRATION TRAILER (12' x 60')

DRY STORAGE ROOM (EXISTING TRANSFORMER VAULT)

ADMINISTRATION PARKING (60' x 100')

TRUCK PULLOVER AREA (12' x 100')

EXISTING OIL/WATER SEPARATOR TO BE DEMOLISHED BY FWENC

TEMPORARY HIGH VISIBILITY FENCE

VISITORS PARKING AREA (60' x100')

TIE-IN FOR WATER LINE HYDRANT

UTILITY CORRIDOR

TRUCK PULLOVER AREA (12' x 100')

SITE ENTRANCE GATE LOCATION

RUINS

RTE. VEHICLE STORAGE

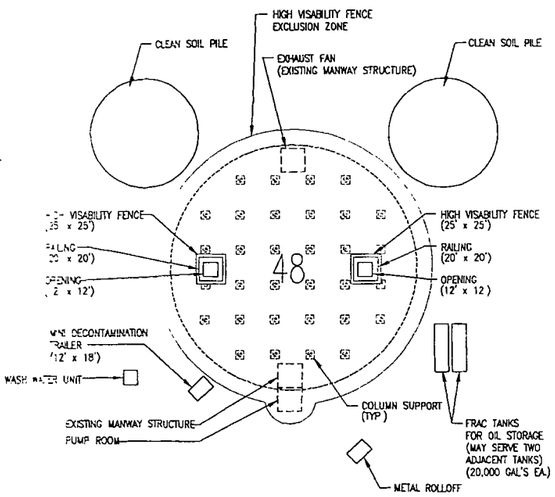
DEFENSE HIGHWAY

RAILROAD

47 48 46 44 41 43 45 40 42 39 38 37 27.4 22

100' 75' 50' 110'

1:3



DETAIL 1

TYPICAL EQUIPMENT LAYOUT
AT EACH TANK LOCATION
SCALE 1" = 50'

PREPARED BY

FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE, BOSTON, MASSACHUSETTS 02210

BASE MAP DERIVED FROM

MELVILLE SOUTH EXISTING CONDITIONS MAP, NETC DWG 31062-307 DATED 4/95, FROM THE DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND, EDUCATION AND TRAINING CENTER, NEWPORT, RHODE ISLAND

GRAPHIC SCALE IN FEET
50 0 100 200 300 400
CONTOUR INTERVAL 5 FEET

FIGURE 1-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION
BOSTON, MASSACHUSETTS 02210

DEPT	DESIGNED	PREPARED	CHECKED	APPROVED	DATE
	FPZ	FPZ			4/16/96

SCALE	DRAWING NUMBER	CAD FILE NUMBER	SH OF	REV
1"=100'	1284.0013 C4	C4-FIG12.DWG		

NETC DWG NO XXXXXX
DSGN XXXXX
DR. XXXX
BR
DIR
APPROVED DATE
SATISFACTORY TO
DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL EDUCATION AND TRAINING CENTER
NEWPORT, RHODE ISLAND

TANK FARM 4 CLOSURE
NAVY REMEDIAL ACTION CONTRACT
DELIVERY ORDER NO.13
SITE PLAN

SIZE	CODE IDENT NO.	MANFAC DRAWING NO.
F	80091	
SCALE XXXX		CONSTR. CONTR. NO. XXXXX
	SPEC XXXXX	SHEET X OF X

1.4.2 The Term "Contractor"

The term "Contractor" within this SOW shall mean Foster Wheeler Environmental or the person delegated responsible charge of work by Foster Wheeler Environmental, or its authorized agents and assistants, acting jointly or severally within the scope of the particular duties and authorities delegated to them.

2.0 SCOPE OF WORK

2.1 Scope of Work

The Subcontractor shall supply, install and service three (3) identical, separately operated, 100 gallon per minute (gpm) skid-mounted wastewater treatment units as part of a wastewater treatment system. The treatment system is to be operated by Foster Wheeler Environmental for treatment of wastewater produced during the remediation of the Tank Farm 4 USTs. This water will be collected and require treatment for oil, grease and solids removal before it can be discharged to the local Publicly Owned Treatment Works (POTW).

Included in Appendix A are Technical Specifications that are an integral part of this SOW.

Technical Specification for Wastewater Treatment System
Section 15060 - Plastic Pipe, Fittings and Valves

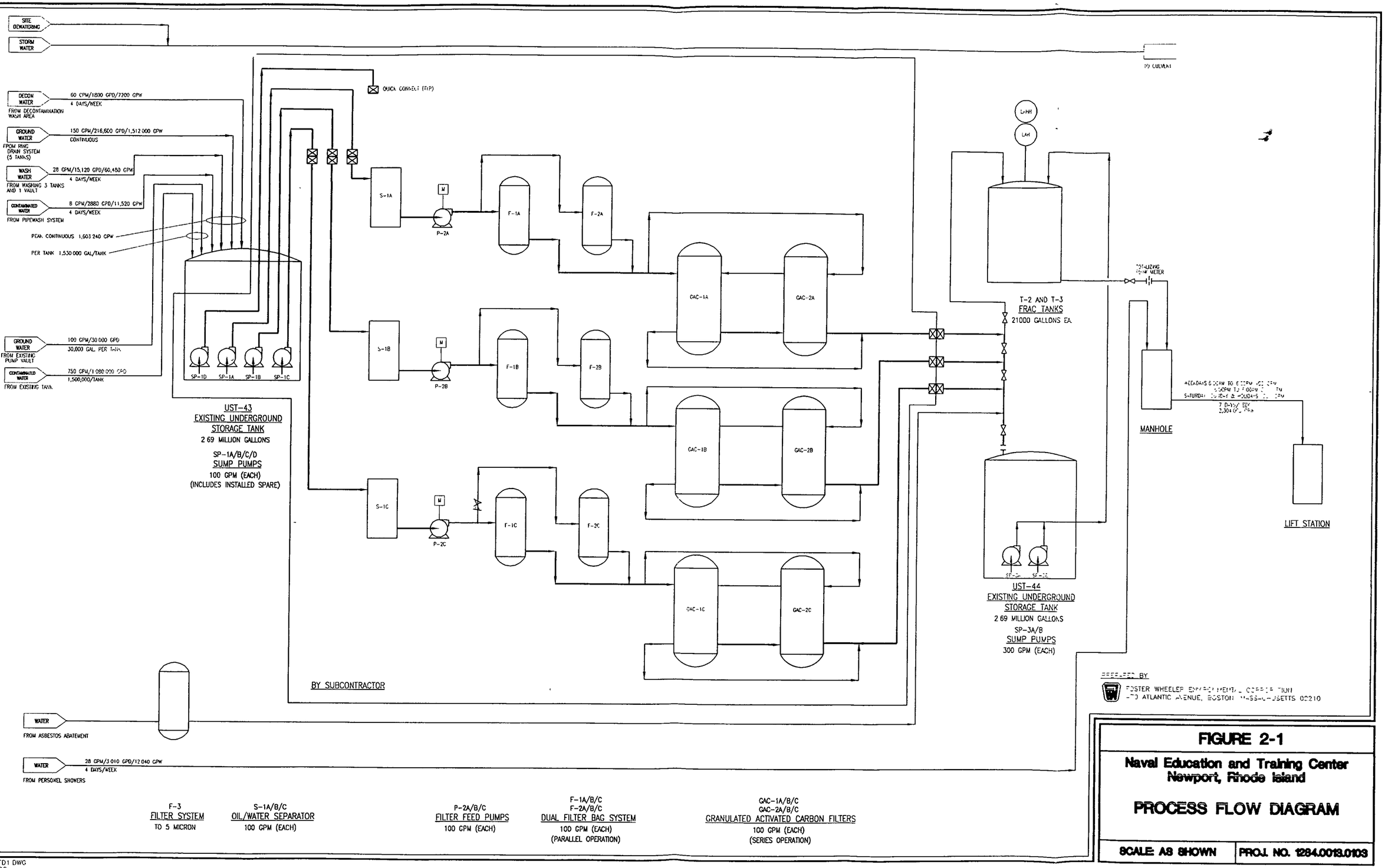
The Subcontractor shall immediately bring to the attention of Foster Wheeler Environmental's technical representative any conflicts noted in the Technical Specification or conflicts between the Technical Specifications and the information presented in the SOW.

2.2 Wastewater Treatment System

The wastewater treatment units shall be located on a treatment pad which is approximately 60 feet x 80 feet. The treatment pad (to be provided by Foster Wheeler Environmental) will be level and constructed of crushed stone with liners (geotextile and high density polyethylene) beneath and bermed with hay bales. The oil/water separators will be located outdoors but the pumps, bag filters and carbon adsorption units will be sheltered within a temporary structure approximately 40 feet x 80 feet (to be provided by Foster Wheeler Environmental). The temporary structure can be ventilated if required to meet the Subcontractor's wastewater treatment systems design requirements. If the Subcontractor's wastewater treatment system design requires venting of specific equipment, these vents, and its controls shall be furnished by the Subcontractor. The temporary structure subcontractor will only provide the openings in the structure for any required vent piping. A flow diagram of the proposed treatment system is shown in Figure 2-1 and each unit shall consist of:

1. An oil/water separator;
2. A filtration system, and
3. A liquid phase activated carbon system.

Each oil/water separator, filtration system and liquid phase activated carbon system shall be skid mounted, and shall have a single power hook-up via a primary fused disconnect. Each unit shall



F-3
FILTER SYSTEM
TO 5 MICRON

S-1A/B/C
OIL/WATER SEPARATOR
100 GPM (EACH)

P-2A/B/C
FILTER FEED PUMPS
100 GPM (EACH)

F-1A/B/C
F-2A/B/C
DUAL FILTER BAG SYSTEM
100 GPM (EACH)
(PARALLEL OPERATION)

GAC-1A/B/C
GAC-2A/B/C
GRANULATED ACTIVATED CARBON FILTERS
100 GPM (EACH)
(SERIES OPERATION)

FIGURE 2-1

Naval Education and Training Center
Newport, Rhode Island

PROCESS FLOW DIAGRAM

SCALE: AS SHOWN | PROJ. NO. 1284.0013.0103

1284PFD1.DWG
4/16/3E

include sump pumps as needed to pump the water from the influent holding tank (UST 43) to the system, transfer the water through the system at the specified rate, and pump the treated water into Foster Wheeler Environmental supplied storage tanks. The wastewater to be pumped from UST 43 is situated between an oil layer and a sludge bottom layer. As a result the Subcontractor shall position the sump pumps and associated controls such that only the water layer is removed from the UST. The elevation of UST-43 and the tank gauging report for the oil/water interface are provided in Appendices B and C, respectively.

All piping, valves and instrumentation required for proper automatic operation and system shutdown shall be provided on the skid. Instrumentation for all three treatment units shall be wired into one main control panel. The instrumentation and controls shall also be capable of receiving a high and high/high level signals from the effluent storage tank. The high level signal shall activate a warning light and the high/high level signal shall automatically shutdown the treatment system. The level controls for the effluent Frac-tank and Tank 44 shall be provided by the Subcontractor.

The Subcontractor shall provide adequate piping and valves to isolate each piece of equipment for servicing or replacement. Wastewater and treated water storage tanks will be provided by Foster Wheeler Environmental in the form of one or more Frac-tanks and/or the utilization of one of the existing USTs (UST-43 and UST-44) at Tank Farm 4. The elevation of UST-43 and UST-44 is provided in Appendix B. The Frac-tank(s) will be equipped with several 'quick-connect' connections. The Subcontractor shall provide quick-connect fittings for all influent hosing required for operation of their system. The Frac-tanks will be located in a near proximity (about 100 feet) to the skid.

The system will be operated by Foster Wheeler Environmental and operation time will be dependent on the amount of water generated during remediation of Tank Farm 4. Presently, it is anticipated that the remedial activities will require the continuous operation of the treatment system 24 hours per day, seven days per week. Treated water will be stored in effluent holding tanks prior to discharge to the local POTW.

2.3 Wastewater Treatment System Design

The Subcontractor shall be required to provide the design of the wastewater treatment system. The design shall include all equipment data, calculations, in-shop testing and drawings required to mobilize, operate, maintain and demobilize the system. The oil/water separator shall have secondary containment to prevent wastewater discharge on to the ground. The design shall include a plan for Spill Prevention, Containment and Control for the oil/water separator and a plan for Operation and Maintenance(O&M) which shall include an O&M manual.

The wastewater treatment system shall fit in an area of approximately 60 feet by 80 feet. The pumps, bag filters and carbon adsorption systems shall be placed within a temporary structure approximately 40 feet by 80 feet.

The Subcontractor shall provide sufficient instrumentation (i.e., flowmeters, level indicators, pressure gauges, etc.) and redundancy to the treatment units to insure a continuous overall system throughput of 300 gpm. Foster Wheeler Environmental will be providing operating personnel during all hours of operation. Normal maintenance and potential equipment failures shall be clearly described in the O&M Manual complete with instrumentation indication and actions to be taken to ensure a minimum amount of downtime. Any failures which could decrease the overall throughput to less than 300 gpm for more

than two (2) hours shall be identified with an estimate of duration and magnitude (gpm) of decreased throughput.

Upon award of this contract Foster Wheeler Environmental will inform the Subcontractor of the type of hosing and quick-connect equipment required for connection to the Frac-tanks and UST-44. The Subcontractor's submittals shall clearly call out all interface points and conditions (pressure, temperature, size) with sufficient specificity to insure compatibility.

The Subcontractor shall also submit a list of spare parts, local distributors and cost to replace each item during servicing of the system. The Subcontractor shall also provide a list of spare parts to be maintained on-site to minimize potential down times as well as a list of expendable parts (i.e., bag filters) to be provided.

The wastewater treatment system design is to be signed by a Registered Professional Engineer (PE) licensed to practice in the State of Rhode Island in the discipline indicated on the design drawings.

2.4 Deliverable Requirements

This section identifies the deliverables to be provided to Foster Wheeler Environmental to ensure successful completion of this project. The Subcontractor will schedule and prepare the following deliverables:

1. Health and Safety Medical Surveillance, and Training Records (where required)

2. Equipment and Materials List, Data, Spare Parts list and price, Calculations and Engineering Drawings (See Technical Specifications)

3. Activity Hazard Analyses

4. Operation and Maintenance Manual

5. Spill Prevention, Containment and Control Plan for oil/water separator

6. Warranty Information

3.0 CODES AND STANDARDS

Services furnished will be in accordance with the technical specifications and general conditions outlined in this SOW. Changes may be implemented by mutual consent in writing between the Subcontractor and Foster Wheeler Environmental. In addition to these conditions and specifications, the Subcontractor shall comply with all applicable federal, state and local ordinances, laws, and regulations. In the event of any apparent conflict among codes, standards, or this specification, the Subcontractor shall refer the conflict to Foster Wheeler Environmental for written resolution.

4.0 HEALTH AND SAFETY

All on-site activities shall be subject to the requirements of the Site Health & Safety Plan (SHSP) which will be provided to the Subcontractor upon contract award. Subcontractor personnel must meet the requirements of this plan and follow the directions of the Site Health and Safety Officer (SHSO) to protect personnel and/or the environment. Prior to initiating field activities, the Subcontractor shall

review the SHSP and certify in writing, their understanding and intent to comply with all applicable requirements. In addition, the accepted activity hazard analysis (AHA) shall be complied with by the Subcontractor during performance of the work at the Site.

Foster Wheeler Environmental will provide management and oversight for all Health and Safety activities. Foster Wheeler Environmental's SHSO will have authority to terminate the Subcontractor's field operations if the SHSO judges that the operations violate Foster Wheeler Environmental's SHSP.

The Subcontractor will be required to comply with all applicable OSHA (1910 and 1926) safety and health standards in addition to the requirements of the Foster Wheeler Environmental SHSP. All Subcontractor employees will be required to attend a Site-Specific Safety and Health Training session prior to mobilization on the site and daily (~ 20 minutes) health and safety briefings. No intrusive work is expected during aboveground installation of the treatment system skids therefore, on-site personnel performing this activity will not be required to have OSHA 40-hour Hazardous Waste Site (HAZWOPER) Training. However, all Subcontractor personnel are required to meet with the SHSO before entering the site, and documentation of successful completion of HAZWOPER and Confiuned Space Entry Training will be required for those personnel who will be installing the sump pumps or servicing the system once operations begin. Documentation will include current refresher training, and enrollment in a medical monitoring program in accordance with 29 CFR 1910.120.

5.0 RESPONSIBILITIES OF THE SUBCONTRACTOR

5.1 Subcontract Services

The work shall include, but not be limited to, providing supervision, labor, materials, equipment and support facilities necessary to mobilize, service, decontaminate and demobilize the wastewater treatment system as described in this Statement of Work and included in the Technical Specifications. The Subcontractor will be required to cooperate with other construction efforts that will be performed by others concurrently on-site.

The work shall also include servicing of the wastewater treatment system units at any time during its operation on-site. This service will include response within 24-hours of notification of system break-down. The Subcontractor shall provide one (1) set of spare parts to be stored on site with the treatment system for quick replacement and nine months worth of expendable parts.

5.2 Training

The Subcontractor shall provide a representative for training during start-up. Training shall be for one eight hour day of system operation.

5.3 Mechanical Testing

Prior to start-up, the treatment system shall be hydrostatically tested for leaks at 150 % of the maximum operating pressure.

During training, the wastewater treatment units will each be operated at design flows, using non-contaminated water (to be supplied by Foster Wheeler Environmental), for a continuous 2 hour period (approximately 36,000 gallons) to show proper operation of mechanical equipment. During training the

system will also be tested to confirm that the effluent from each unit meets the criteria specified in the Technical Specification when processing the contaminated waters and that an overall throughput of 300 gpm can be sustained.

5.4 Decon of Equipment (Prior to Arrival)

All non-disposable tanks, piping, hoses, pumps, and treatment equipment shall be decontaminated by the Subcontractor prior to use at the site. The Subcontractor shall verify in writing that all equipment is new or has been decontaminated prior to its arrival at the site. All equipment shall be free of liquid at arrival to the site.

5.5 Waste Collection

The Subcontractor shall keep the work site and adjacent area as free of debris and rubbish as is practicable during mobilization, servicing and de-mobilization. All waste products generated during the initial start-up of the wastewater treatment operation, including sludges, solids, decontamination fluids, and used personal protective equipment (PPE) shall be segregated and containerized in DOT-approved drums provided by Foster Wheeler Environmental. The drums shall be labeled to indicate media, date of collection and origin of the material. All waste products generated during servicing will also be drummed. Foster Wheeler Environmental will be responsible for disposal of drummed material. The Subcontractor shall be responsible for the disposal and/or regeneration of all granulated activated carbon.

5.6 Quality Control

The Subcontractor shall perform high quality work in accordance with the referenced technical specifications and all other permits or applications required. All field activities shall be conducted in an efficient and professional manner with minimal damage to the environment.

To ensure that the Subcontractor performs high-quality work in accordance with specifications, the Foster Wheeler Environmental Quality Control Manager will inspect the work at completion and periodically inspect the system during operation. Any discrepancies will be noted by Foster Wheeler Environmental and will be provided to the Subcontractor in writing by the end of the following work day. The Subcontractor shall be responsible for addressing the discrepancies. The Subcontractor shall be responsible for any adjustments or repairs required for proper operation of the wastewater treatment system.

5.7 Permits

The Subcontractor shall be responsible for informing Foster Wheeler Environmental of all federal, state and local requirements for design and installation of the wastewater treatment system and securing all required permits. All federal, state and local permits required for operation of the treatment system will be secured by Foster Wheeler Environmental.

5.8 Equipment Decon and Waste Disposal

Equipment that has come into contact with contaminated wastewater during operation of the treatment system shall be decontaminated, by the Subcontractor, following completion of the project and prior to transportation off-site. Subcontractor shall decontaminate equipment in a manner which minimizes waste generation, and such that all water is treated in the system. Foster Wheeler Environmental will provide

storage, transportation and disposal for waste, both solid and liquid, produced on the site. However, the Subcontractor shall be responsible for the disposal and/or regeneration of granular activated carbon.

6.0 RESPONSIBILITIES OF FOSTER WHEELER ENVIRONMENTAL

6.1 Site Access

Access to all locations will be arranged by Foster Wheeler Environmental prior to commencement of work. No Subcontractor personnel and equipment are to enter any location without first obtaining clearance from Foster Wheeler Environmental.

6.2 Review of Design

Foster Wheeler Environmental will review the design submitted by the Subcontractor and provide comments. The Subcontractor will be required to incorporate the comments into subsequent submittals, or to resolve comments with Foster Wheeler Environmental prior to final acceptance.

6.3 Utilities

Foster Wheeler Environmental will provide 460 volt, 3-phase electrical power to the site and all other utility hook-ups, as indicated by the Subcontractor in the wastewater treatment system design submittal, and will be responsible for all utility operating costs. Interior and exterior lighting needed during operation of the treatment system will also be provided by Foster Wheeler Environmental.

6.4 Site Preparation

Foster Wheeler Environmental will provide the treatment pad and temporary structure. The treatment pad will be constructed prior to mobilization of the treatment system and will consist of crushed stone with geotextile and high density polyethylene liners beneath. The perimeter of the treatment pad will also be bermed by continuing the liners over staked hay bales to contain potential spills.

6.5 Security

The treatment system will be located within a fenced area. However, the Subcontractor shall be responsible for securing equipment, tools and material associated with the water treatment system during installation.

6.6 Temporary Facilities

The Subcontractor will be provided with access to a telephone (local calls only), use of a fax machine and photocopying machine during mobilization, servicing and de-mobilization of the wastewater treatment system. Portable toilets shall also be provided by Foster Wheeler Environmental.

6.7 Operation of System

Foster Wheeler Environmental shall be responsible for the operation of the Wastewater Treatment System. Only Foster Wheeler Environmental personnel trained on-site by the Subcontractor will operate the wastewater treatment system.

7.0 SCHEDULE

It is anticipated that the Wastewater Treatment System subcontract will be awarded on or about May 7, 1996. Demobilization of the system is anticipated in January 1997.

The following milestones must be met.

1. Complete and submit the wastewater treatment design, which shall include the Activity Hazard Analysis and the Spill Prevention, Containment, and Control and Operation and Maintenance plans within two weeks of the receipt of a written notice to proceed from Foster Wheeler Environmental.

2. The design will be reviewed by Foster Wheeler Environmental personnel and will be returned to the Subcontractor within one week. The comments are to be addressed and a final submittal package shall be submitted for acceptance within one week of receipt of Foster Wheeler Environmental's comments.

3. The treatment system shall be mobilized and fully operational within four weeks following final submittal package acceptance by Foster Wheeler Environmental. The Subcontractor shall certify that the system is fully operational prior to commencement of field treatment activities.

4. Decontamination and demobilization shall be completed within two (2) weeks of notification by Foster Wheeler Environmental.

8.0 MEASUREMENT AND PAYMENT

The work shall be measured and paid in accordance with the payment tasks included herein and the submitted breakdown provided in the Price Quotation Form. The following payment tasks have been identified:

1. Receipt and acceptance of all submittals required by SOW paragraph 2.4, including the complete design submittal for wastewater treatment system, including calculations, and bearing the stamp and seal of Professional Engineer(s) licensed to practice in Rhode Island.

2. If renting/leasing system - Final Payment upon complete demobilization and removal of wastewater system from the site. Assume 3 treatment units for 7 months.

   Lease term shall commence upon successful mobilization and proof of operation. Lease term shall terminate upon notification by Foster Wheeler Environmental for Subcontractor to decontaminate and demobilize the unit(s).

3. Mobilization, and successful testing and start-up operation of wastewater treatment system on-site and described in SOW paragraphs 5.1, 5.2 and 5.3.

4. Service costs for periodic servicing of equipment and replacement of parts as described in SOW paragraph 5.1. Assume 3 treatment units for 7 months.

5. Training of Foster Wheeler Environmental personnel as described in SOW paragraphs 5.2 and 5.3.

6. Cost of recharging/replacing activated carbon (including disposal or regeneration). Assume one carbon vessel/month/unit for 7 months.

7. Decontamination and demobilization of the wastewater treatment system in accordance with Section 5.8 - Equipment Decon and Waste Disposal.

Option:

8. If exercising the purchase option for treatment system - Payment for equipment upon successful operation of system for a period of 60 days, meeting discharge criteria for purchase agreement.

APPENDIX A

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATION
FOR
WASTEWATER TREATMENT SYSTEM

1.1 SYSTEM DESCRIPTION

The Wastewater Treatment System will treat wastewater generated from remedial activities associated with the closure of underground storage tanks (USTs). These activities include material removal, cleaning and repair. The system will consist of three (3) identical, individually operated wastewater treatment units, operated in parallel, which will each feed from an existing UST (UST-43). The pumps will be required to pump the water through the system at a rate of 100 gallons per minute (gpm) per treatment unit, for a total design flowrate of 300 gpm for the complete system.

The wastewater treatment units shall each consist of an oil-water separator; a filter system consisting of bag filters; and a liquid phase activated carbon unit. Each treatment unit shall be mounted on skids and shall be able to be easily moved by fork-lift and/or truck (no cranes). The oil/water separators are to be located outdoors while the pumps, bag filter systems, and carbon adsorption systems are to located within a temporary structure. **The Subcontractor is encouraged to provide a standard unit alternative, if available.**

The treated effluent will be stored in storage tanks located in close proximity (150 foot radius) to the treatment system.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 395	(1988) Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B 16.1	(1989) Cast Iron Pipe Flanges and Flanged Fittings
ASME B 16.5	(1988; Errata) Pipe Flange and Flanged Fittings

ANTI-FRICTION BEARING MANUFACTURERS ASSOCIATION, INC. (AFBMA)

AFBMA 11	(1990) Load Ratings and Fatigue Life for Roller Bearings
AFBMA 9	(1990) Load Ratings and Fatigue Life for Roller Bearings

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG	(1987) Rev. 1 Motors and Generators
NEMA ICS 6	(1988) Rev. 1 Enclosures for Industrial Control and Systems

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1996.3) National Electric Code

HYDRAULIC INSTITUTE (HI)

HI-01 (1983; 14th Ed) Standards for Centrifugal, Rotary and Reciprocating Pumps

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

IEEE 100 (1988) Dictionary of Electrical and Electronics Terms

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C2 (1993) National Electrical Safety Code

AMERICAN PETROLEUM INSTITUTE (API)

American Petroleum Institute Manual on Disposal of Refinery Wastes, Volume on Liquid Wastes, Chapter 5 - Oil Water Separator Process Design

UNDERWRITERS LABORATORIES INC. (UL)

UL 58 Standard for Safety

1.3 DESIGN REQUIREMENTS

1.3.1 Application

The process stream shall undergo oil/water separation, filtration and carbon adsorption to remove total suspended solids and organics before the water is discharged to the local POTW. The oil/water separator will be fully enclosed.

1.3.2 Operation

The units shall be designed for continuous operation (24 hours per day, 7 days per week). Under normal operation, water will be pumped at a rate of 100 gpm through each treatment train consisting of an oil/water separator, a filtration system, and liquid phase carbon adsorption units. The liquid phase carbon adsorption units for each unit will be operated in series.

1.3.3 General Requirements

The Subcontractor shall assume full responsibility for the suitability, adequacy and safety of the design, construction and performance of the system specified herein. The oil/water separator, filtration system (bag), and carbon adsorption units shall be selected and designed to yield satisfactory hydraulic and mechanical performance for the service conditions specified herein. It is not the intent of the specification to completely specify all the details of design and fabrication. All systems are to be provided with accessories and features that are consistent with the Subcontractor's standard practices, when such practices do not conflict with this specification. In addition, the equipment is to conform to accepted industry standards with respect to design and workmanship. Sufficient instrumentation shall

be provided to ensure operator's ability to assess the hydraulic parameters of each component of the system.

All systems shall be designed for service in an indoor chemical plant type environment or weatherproof environment and shall be suitable for start-up and operation at the conditions specified. All units shall be shipped with an initial material (i.e. virgin carbon, filtration bags) and be ready for installation and operation. The system shall be delivered with one set of spare parts and nine months of expendable parts.

1.3.4 Influent Characteristics (per treatment train, 3 total)

Design Flow Rate, gpm (max)	100
Temperature, F	50-90
pH	6.5-8.0
Total dissolved solids, ppm	183 - 5,560 *
Total suspended solids, ppm	<1.0 - 94 *
Oil & Grease , ppm	2.2 - 93
Chemical Oxygen Demand (COD), ppm	28 - 1,330
Biological Oxygen Demand (BOD), ppm	36 - 206
Total Toxic Organics, ppm	3.0*

* Based on analytical data from Tank Farm 5 which is summarized in Tables 1 and 2. Similar materials (No. 2 and No. 6 fuel oils) were stored at Tank Farms 4, therefore it is anticipated that Tank Farm 4 water will have similar characteristics to the water at Tank Farm 5. Analytical data for Tank Farm 4 will be provided once it becomes available.

1 3.5 Effluent Goals **

Total Suspended Solids, ppm	285
Chemical Oxygen Demand (COD), ppm	230
Biological Oxygen Demand (BOD), ppm	230
Total Toxic Organics (TTO), ppm	2.0
Oil & Grease, ppm	25
Temperature	<104 °F
pH	5.0 - 10.0

** Based on POTW acceptance criteria which was established for the remediation of Tank Farm 5. Effluent goals for Tank Farm 4 will be provided once they become available

1.4 SUBMITTALS

SD-02 Manufacturer's Catalog Data

a Pumps
b. Oil/water separator
c. Filtration System
d. Liquid Phase Carbon Adsorption Units
e. Instrumentation and Valves
f. Hoses and Quick-connection equipment

SD-04 Shop/Fabrication Drawings

Submit shop drawings for all system units: arrangement drawing(s) with dimensions, operating materials specifications (i.e. carbon, filter bags), materials of construction, flow-pressure drop curves, leak test procedures, mounting/installation details, tie-in connections with locations, equipment dry and operating weight, electrical schematics, wiring diagrams, and flow schematics. Electrical and electronic terms used in the drawings shall be as defined in IEEE 100.

SD-05 Design Data

Submit design analysis and calculations supporting:

a. Pumps - catalog pump curves (gallons per minute versus total head in feet)
- equipment nameplate data, including motor information (full-load)

b. Oil/water separator - Sizing and hydraulic loading

c. Filtration System -Bag filter: selection of filter element, flow capacity, pressure drop, permeability, and support basket open area

d. Carbon Adsorption Units - selection of carbon type and capacity, carbon usage, bed depth, carbon loading, flow capacity and pressure drop

e. Hydraulic profile for the entire system

f. Electrical Load requirements - Normal and peak for the system (volts and amps)

SD-09 Reports

Test report for the filtration and carbon adsorption units shall be submitted on the following tests:

a. Functional Tests
b. Hydrostatic/Leakage Tests

SD-19 Operation and Maintenance Manual

Submit five (5) copies of operation and maintenance (O&M) data/manuals which are specially applicable to this system and a complete and concise depiction of the provided equipment and overall system operation. Present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index for the O&M manuals..

1.5 TESTING

All system units and interconnecting piping shall be hydrostatically tested at 150% of the maximum operating pressure.

PART 2 PRODUCTS

2.1 CENTRIFUGAL PUMPS

2.1.1 Design Requirements

Each pump and motor unit shall be supplied, mounted on a common baseplate and frame. All pumps shall be designed to meet the required flow rate (100 gpm) and head pressure required for selected equipment and shall be a completely assembled and ready for operation, inclusive of external piping, wiring and controls.

Pumps shall be of a proven type suitable for the process and ambient conditions.

Pumps shall be selected at a point within the maximum efficiency for a given impeller and casing combination.

Pumps shall not have impeller diameters larger than 90 percent of the published maximum diameter of the casing or less than 15 percent larger than the published minimum diameter of the casing. Pump casing shall be adequately sized to permit substitutions of larger diameter impeller to achieve a 10% increase in head at rated capacity.

Required net positive suction head (NPSH) for the largest diameter impeller useable with each casing design shall not exceed the available suction conditions calculated by the Subcontractor.

Pumps shall be suitable for operation at indoor and outdoor temperatures without vapor binding and without cavitation under any system operating condition. The only acceptable means of rectification of cavitation shall be replacement of entire pump assembly.

Available NPSH shall exceed required NPSH by not less than 1.5 feet.

2.1.2 General Pump Requirements

This specification includes design, construction, installation, and performance features of self priming centrifugal pumps. Pumps provided shall conform to HI-01 standards for centrifugal pumps, and to requirements specified herein. Each pump assembly shall be provided as a complete factory assembled unit including pump, motor, couplings and coupling guards on a common baseplate.

2.1.3 Classification

Horizontal shaft, split-case, single-stage, end-suction, single volute, centrifugal type.

2.1.4 Casing

Pump casings shall be ductile cast iron per ASTM A 395 with a design working pressure of not less than 185 pounds per square inch gage (psig) at 100 degrees F. Cast iron casings shall be single volute with flanged piping connections conforming to ASME B 16.1, Class 125. Ductile cast iron casings shall have 150 lb. FF flanged end connections per ASME B 16.5. The direction of shaft rotation shall be conspicuously indicated. The casing shall have a tapped opening for draining at a low point in the casing. Drain openings in the volute, intake, or other passages capable of retaining trapped fluid shall be located in the low point of such passages.

2.1.5 Impellers

Impellers shall be enclosed design, stainless steel. Impellers shall meet maximum and minimum diameter requirements. Impellers may be either one-piece construction or assemblies. When assembled impellers are supplied, whether welded or mechanically joined, Manufacturer shall provide data to demonstrate the integrity of the impeller at maximum pump speed and flow. Mechanically joined impeller assemblies shall have positive features to prevent loosening of the fasteners from vibration.

2.1.6 Balancing

When the pump is installed on its permanent baseplate, the magnitude of vibration shall not exceed 0.002 inches. The pump shall operate smoothly throughout its range in reaching the operating speed.

2.1.7 Wearing Rings

Wearing rings shall be of suitable composition for the intended service Wearing rings shall be provided in every pump case and on all impellers larger than 7 inches in diameter

2.1.8 Shaft

Shafts for mechanical-seal service shall be solid or sleeved and all materials shall be compatible with the fluids handled. Shafts shall be of adequate strength to withstand the maximum torque which can be transmitted by the motor driver. If shaft sleeves are provided, no leakage between the sleeve and shaft is permitted. Sleeves, if provided, shall be field replaceable. Pressed-fitted sleeves are not acceptable. Guards shall also be provided per OSHA requirements.

2.1.9 Mechanical Seals

Mechanical seal arrangement shall prevent leakage of the pumped fluids to the atmosphere under all normal operating conditions.

The seals shall be selected for severe duty for the type of fluid to be pumped and the concentrations of solids which are expected to exist. The inner seal shall be located as close to the inside of the pump casing as possible, and casing design shall provide sufficient space to allow solids to clear away from the area near the inner seal face. The flushing liquid openings in either the stuffing box or gland shall be arranged to direct flushing liquid at the seal faces.

Mechanical seals shall be balanced or unbalanced, as necessary to conform to specified service requirements. Mechanical seals shall be constructed in a manner and of materials particularly suitable for the temperature service range and fluids handled.

Seal construction shall not require external source cooling for pumped-fluid service temperatures up to 250 degrees F.

Seal pressure rating shall be suitable for maximum system hydraulic conditions

Materials of construction shall be suitable for the fluids handled.

2.1.10 Bearings and Lubrication

Bearings shall be heavy-duty ball or roller type with full provisions for the mechanical and hydraulic radial and thrust loads imposed by any normal service condition. Bearings shall be manufactured from

vacuum-degassed or processed-alloy steel. Bearings shall have an L-10 rated life of not less than 30,000 hours or an average life of 150,000 hours in accordance with AFBMA 9 or AFBMA 11.

Bearings shall be grease lubricated and shall be provided with grease supply and relief fittings located at bottom of bearings.

Bearing housings shall be cast iron, self-aligning on metal-to-metal surfaces and shall totally enclose bearings. The support under the outboard end of the bearing housing, if used, shall allow axial thermal expansion and contraction without imposing stress on the housing.

2.1.11 Flexible Coupling

Pump shaft shall be connected to the motor shaft through a flexible coupling. The flexible member shall be a tire shape in shear, or a solid-mass serrated-edge disk shape made of chloroprene materials and retained by fixed flanges. Flexible coupling shall act as a dielectric connector and shall not transmit sound, vibration, or end thrust.

All couplings in intermittent on/off service shall have couplings selected on the basis of a 2.0 service factor. Other service factors shall be in accordance with the manufacturer's instructions. Provide OSHA approved coupling guard.

2.1.12 Baseplate

Pump and driver shall be mounted on a fabricated steel base constructed of a rolled structural-steel perimeter frame, reinforced and cross-braced internally with pipe or rolled structural members, capped with 1/4 inch steel plate, and provided with adequate drip rim and drain tapping. Alternately, the Subcontractor may submit for approval a formed or bent steel baseplate.

2.1.13 Motors

Each electric motor-driven pump shall be driven by a totally-enclosed fan cooled continuous-duty electric motor. Motor shall have a 1.15 service factor. Motors shall be high efficiency type, squirrel-cage induction motors having normal-starting-torque and low-starting-current characteristics, and shall be of sufficient size so that the nameplate horsepower rating will not be exceeded throughout the entire published pump characteristic curve. Motor bearings shall provide smooth operations under the conditions encountered for the life of the motor. Adequate thrust bearing shall be provided in the motor to carry the weight of all rotating parts plus the hydraulic thrust and shall be capable of withstanding upthrust imposed during pump starting and under variable pumping head conditions specified. Motors shall be rated 460 VAC. All motors shall be 3 phase, 60 Hz, 1800 RPM (unless otherwise noted) and such rating shall be stamped on the nameplate. Class F insulation with a class B temperature rise at 40 degrees C ambient. Motors shall conform to NEMA MG 1 and be UL Listed.

2.1.14 Painting

Provide manufacturer's standard finish on all centrifugal pump assemblies Stainless or alloy steel components shall not be painted.

2.1.15 Design Requirements

Pump capacity design requirements and characteristics calculated by the Subcontractor and not specific herein shall be documented and submitted to Foster Wheeler Environmental.

2.1.16 Noise

Centrifugal pump assemblies shall be designed, constructed and installed to operate at a noise level not to exceed 85 dba at 3 feet under any load operating conditions. The Subcontractor shall damp all pumps, motors, and fans where possible in order to reduce noise transmissions.

2.2 SUMP PUMPS

2.2.1 Design Requirements

All pumps shall be designed to meet the required flow rate (100 gpm) and head pressure required for selected equipment and shall be a completely assembled and ready for operation, inclusive of external piping, wiring and controls.

Pumps shall be of a proven type suitable for the process and ambient conditions.

Pumps shall be installed through a 12 foot by 12 foot opening in the top of UST 43 which will be provided by Foster Wheeler Environmental. A Gantry Crane system will also be provided by Foster Wheeler Environmental to install, support and adjust elevations of the sump pumps installed within UST-43.

2.2.2 General Pump Requirements

This specification includes design, construction, installation, and performance features of submersible centrifugal pumps. Pumps provided shall conform to HI-01 standards for centrifugal pumps, and to requirements specified herein. Each pump assembly shall be provided as a complete factory assembled unit including pump, motor, couplings and coupling guards on a common baseplate.

2.2.3 Materials of Construction

Submersible pumps shall be constructed of materials suitable for the service and conditions intended.

2.2.4 Impellers

Impellers shall be enclosed design, stainless steel. Impellers shall meet maximum and minimum diameter requirements. Impellers may be either one-piece construction or assemblies. When assembled impellers are supplied, whether welded or mechanically joined, Manufacturer shall provide data to demonstrate the integrity of the impeller at maximum pump speed and flow. Mechanically joined impeller assemblies shall have positive features to prevent loosening of the fasteners from vibration.

2.2.5 Balancing

When the pump is installed on its permanent baseplate, the magnitude of vibration shall not exceed 0.002 inches. The pump shall operate smoothly throughout its range in reaching the operating speed.

2.2.6 Wearing Rings

Wearing rings shall be of suitable composition for the intended service. Wearing rings shall be provided in every pump case and on all impellers larger than 7 inches in diameter.

2.2.7 Shaft

Shafts for mechanical-seal service shall be solid or sleeved and all materials shall be compatible with the fluids handled. Shafts shall be of adequate strength to withstand the maximum torque which can be transmitted by the motor driver. If shaft sleeves are provided, no leakage between the sleeve and shaft is permitted. Sleeves, if provided, shall be field replaceable. Pressed-fitted sleeves are not acceptable. Guards shall also be provided per OSHA requirements.

2.2.8 Mechanical Seals

Mechanical seal arrangement shall prevent leakage of the pumped fluids under all normal operating conditions

The seals shall be selected for severe duty for the type of fluid to be pumped and the concentrations of solids which are expected to exist. The inner seal shall be located as close to the inside of the pump casing as possible, and casing design shall provide sufficient space to allow solids to clear away from the area near the inner seal face. The flushing liquid openings in either the stuffing box or gland shall be arranged to direct flushing liquid at the seal faces

Mechanical seals shall be balanced or unbalanced, as necessary to conform to specified service requirements. Mechanical seals shall be constructed in a manner and of materials particularly suitable for the temperature service range and fluids handled.

Seal construction shall not require external source cooling for pumped-fluid service temperatures up to 250 degrees F.

Seal pressure rating shall be suitable for maximum system hydraulic conditions.

Materials of construction shall be suitable for the fluids handled.

2.2.9 Bearings and Lubrication

Bearings shall be heavy-duty ball or roller type with full provisions for the mechanical and hydraulic radial and thrust loads imposed by any normal service condition. Bearings shall be manufactured from vacuum-degassed or processed-alloy steel. Bearings shall have an L-10 rated life of not less than 30,000 hours or an average life of 150,000 hours in accordance with AFBMA 9 or AFBMA 11.

Bearings shall be grease lubricated and shall be provided with grease supply and relief fittings located at bottom of bearings.

Bearing housings shall be cast iron, self-aligning on metal-to-metal surfaces and shall totally enclose bearings. The support under the outboard end of the bearing housing, if used, shall allow axial thermal expansion and contraction without imposing stress on the housing.

2.2.10 Motors

Each electric motor-driven pump shall be driven by a totally-enclosed fan cooled, explosion proof, continuous-duty electric motor. Motor shall have a 1.15 service factor Motors shall be high efficiency type, squirrel-cage induction motors having normal-starting-torque and low-starting-current characteristics, and shall be of sufficient size so that the nameplate horsepower rating will not be exceeded throughout the entire published pump characteristic curve. Motor bearings shall provide smooth operations under the conditions encountered for the life of the motor. Adequate thrust bearing shall be provided in the motor to carry the weight of all rotating parts plus the hydraulic thrust and

shall be capable of withstanding upthrust imposed during pump starting and under variable pumping head conditions specified. Motors shall be rated 460 VAC. All motors shall be suitable for Class 1, Division 1, 3 phase, 60 Hz, 1800 RPM (unless otherwise noted) and such rating shall be stamped on the nameplate. Class F insulation with a class B temperature rise at 40 degrees C ambient. Motors shall conform to NEMA MG 1 and be UL Listed.

2.2.11 Painting

Provide manufacturer's standard finish on all centrifugal pump assemblies. Stainless or alloy steel components shall not be painted.

2.2.12 Design Requirements

Pump capacity design requirements and characteristics calculated by the Subcontractor and not specific herein shall be documented and submitted to Foster Wheeler Environmental.

2.3 OIL/WATER SEPARATOR

2.3.1 Design Requirements

The system shall be fully enclosed and the separating chamber shall be properly sized for 100 gpm and engineered in strict accordance to Chapter 3 and 5 of API Manual on Disposal of Refinery Wastes, Volume on Liquid Wastes, Oil-water Separator Process Design.

2.3.2 Components

2.3.2.1 Material of Construction

The oil water separator shall be fabricated from prime grade carbon steel as required by Standard UL-58. The separator shall be cylindrical and thickness shall be in accordance with UL-58.

2.3.2.2 Design Requirements

The oil water separator shall have an integral oil storage capacity of 40% of the total separator volume. The separator shall be designed in a manner to minimize solid build-up in the oil-water separator chamber, which could reduce the oil-water separation of the unit. The separator shall also be designed to be fully enclosed.

2.4 FILTER SYSTEM

2.4.1 Bag Filter

2.4.1.1 Design Standards

Bag filters shall be designed and constructed to meet the following standards:

Flow Capacity	100
Pressure Rating, psig	*
Clean Bed Pressure Drop, psi	*
Maximum Allowable Pressure Drop, psi	*
Total Filter Area sq. Ft.	*
Inlet/Outlet Connection, Size/Rating	*

Drain Connection, Size/Rating	*
Number of Bag/Basket Assemblies	2
Inner Bag	*
Bag Size Number	*
Smallest Particle Size Retained, microns	20
Surface Area, sq. ft.	*
Basket Open Area	*
Basket Perforation Size, in.	*

* To be determined by Subcontractor to meet the effluent criteria specified.

2.4.1.2 Type

Provide dual stage bag filters consisting of an inner filter bag and support basket mounted within another filter bag and support basket. Both the filter bag/support basket assemblies shall be contained within a common housing. Bag filters shall not be backflushable type.

2.4.1.3 Components

2.4.1.3.1 Housings

Provide vertical cylindrical type housings of carbon steel construction. Housings shall be designed and constructed in accordance with ASME Boiler and Pressure Vessel Code Section VIII, Unfired Pressure Vessels, per manufacturer's standard, but in no case less than 30 psig design at 120 F. Housings shall be spot radiographed and code stamped. Housings shall be furnished with dished bottom head. Top of housing shall be furnished with flat O-Ring gasketed cover secured by three eyenut assemblies. One of the eyenut assemblies shall serve as a hinge when the cover is opened. Housings shall be furnished with an O-Ring seal between the rim of the outer basket and housing inside diameter to prevent fluid bypass around the basket. Housings shall be equipped with flanged side inlet and outlet connections, 150 lb flat faced per ANSI B16.5. Provide separate bottom drain connection. All internal surfaces of housings shall be coated with two coats of coal tar epoxy 4-6 mils DFT each. Surface preparation and application shall be per manufacturer's recommendations.

2.4.1.3.2 Filter Elements

Provide inner and outer micron rated filter bags of polyethylene material. Bags shall be designed and constructed to retain solids of size greater than and including size stipulated in Paragraph 2.4.1.1. The Subcontractor shall be solely responsible for selection of suitable bag construction to meet the conditions stipulated herein

2.4.1.3.3 Support Baskets

Provide heavy duty inner and outer support baskets. Baskets shall be sized by Subcontractor to suit the housings and filter bags selected Baskets shall also have open area compatible with the filter bags selected. Subcontractor shall be responsible for selection of suitable basket construction to meet the service conditions specified herein. Baskets shall be equipped with a hinged bail handle to facilitate ease of removal and cleaning. Bail handle shall be pushed down by the closed housing cover to hold the basket against a positive stop in the housing, thereby preventing bypassing of unfiltered liquid. Support baskets shall be constructed of stainless steel.

2.4.1.3.4 Accessories

Provide bag filter housing cover with 1/4 in. NPT for air purge. Provide each filter vessel with a pressure relief valve adequately sized to provide 10% overpressure at filter rated flow capacity or greater if required by pump selected.

2.5 LIQUID PHASE CARBON ADSORPTION

2.5.1 Design Standards

Liquid phase carbon adsorption unit(s) shall be designed and constructed to meet the following standards:

Flow Capacity, gpm	100
Clean Pressure Drop	
@ Flow Capacity, psi	*
Design Temperature, F	*
Design Pressure, psig	*
Maximum Operating Pressure, psig	*
Adsorbent Capacity, lbs.	*
Adsorbent Usage, lbs/day	**
Minimum Contact Time, sec	*
Dimensions (diameter x height) in	*
Shipping Weight, lbs.	*

* To be determined by Subcontractor to meet the effluent criteria specified.

** Based on influent characteristics and effluent goals provided in Paragraphs 1.3.4 and 1.3 5, respectively

2.5.2 Vessels

Provide vertical cylindrical type housings of carbon steel construction. Housings shall be designed and constructed in accordance with ASME Boiler and Pressure Vessel Code Section VIII, Unfired Pressure Vessels, per manufacturer's standard Housings shall be spot radiographed and code stamped.

Vessels shall be equipped with internals designed to permit even flow distribution for full adsorbent utilization and peak removal efficiency without channeling. Vessels shall be furnished with opening(s) to permit access to interior for maintenance or inspection. Vessels shall be DOT rated acceptable for shipment of hazardous spent carbon. Provide separate threaded connections for inlet and outlet, drain and air release. Provide each carbon vessel with a pressure relief valve adequately sized to provide 10% overpressure at the rated flow capacity or greater if required by pump selected.

2.5.3 Adsorbent Media (Activated Carbon)

Provide virgin grade granular activated carbon manufactured from bituminous coal. Subcontractor shall be responsible for selection of suitable quantity and bed depth of carbon and shall advise changeout frequency based upon the process condition stipulated in this specification.

2.6 MATERIALS OF CONSTRUCTION

Unless otherwise stipulated herein, wetted parts of all components shall be compatible with fluids handled. All other materials of construction shall be the Subcontractor's standard for the intended service.

2.7 ELECTRICAL REQUIREMENTS

Interior and exterior lighting to be provided by Foster Wheeler Environmental Corporation

Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70.

Electrical equipment in UST-43 and associated access vault shall be suitable for NEC Class 1, Division 1. Other area electrical equipment shall meet area classifications as required by Subcontractor's system design.

Provide internal wiring for components as an integral part of the system. System power hook-up shall be through one primary fused disconnect line, 3 phase, and 460 volts.

Provide motor starters, step down transformer (if required) and control panel.

Provide electric heat tracing if required during cold weather operation.

2.8 SPECIAL TOOLS

Provide (if any) special tools required for installation or maintenance.

2.9 PAINTING

Structural steel and external surfaces of vessels shall be given corrosion resistant finish per Subcontractor's standard. Stainless steel components shall not be painted.

2.10 LABELING

Subcontractor shall clearly label all vessels and piping associated with the treatment system for quick identification.

2.11 SPARE PARTS

Provide one set of spare parts to be stored on site for quick replacement, and nine (9) months worth of expendable parts. At a minimum, one spare of each piece of rotating equipment shall be stored on-site.

PART 3 EXECUTION

3.1 INSTALLATION

Install all equipment on skid(s) which can be moved by fork lift or truck (no cranes) as indicated on the Subcontractors submitted and approved drawing(s) and in accordance with the manufacturer's installation instructions.

Electrical installations shall conform to ANSI C2, NFPA 70 and requirements specified herein.

3.2 FIELD QUALITY CONTROL

Administer, schedule, conduct and document specified inspections and tests. Furnish personnel, instruments and equipment as necessary for such inspection and testing. Correct defects and repeat the respective inspections and tests.

3.2.1 Inspection

Prior to initial operation, inspect equipment installation for conformance with drawings and specifications. If bolted covers are provided, inspect to insure they are securely fastened per manufacturer's instructions. Air purge vessels prior to initial operation.

3.2.2 Alignment

Pump and driver shall be aligned to manufacturer's maximum permissible tolerance, but in no case shall angularity exceed 0.5 degree nor shall parallel misalignment exceed 0.002 inch. Pump alignment shall be performed under the direction of the manufacturer's representative.

Prior to pump final acceptance the Subcontractor shall submit documentation that the pump and motor are aligned and specified and that the pump will satisfactorily operate over the specified range.

3.2.3 Testing

The Subcontractor in the presence of the Contractor shall hydro- and pressure-test the entire system (including any flexible hosing(with clean water at 150% of the maximum operating pressure prior to system operation.

--END OF SECTION--

SECTION 15060

PLASTIC PIPE, FITTINGS AND VALVES

PART 1 GENERAL

1.2 REFERENCES

The publications listed below form a part of this section to the extent referenced:

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B16.5 - 1988Pipe Flanges and Flanged Fittings

AMERICAN_SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A193	Alloy-Steel and Stainless Steel Bolting Materials for High Temperature
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service
ASTM D 1527	(1989) Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedules 40 and 80
ASTM D 1784	(1990) Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D 1785	(1991) Standard Specification for Poly (Vinyl Chloride) (PVC), Plastic Pipe, Schedules 40, 80, and 120
ASTM D 2235	(1988) Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
ASTM D 2464	(1990) Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D 2467	(1990) Standard Specification for Socket-Type Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D 2564	(1991) Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings
ASTM D 2855	(1990) Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings
ASTM F152	
ASTM F 437	(1989b) Standard Specification for

	Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
ASTM F 439	(1990) Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
ASTM F 441	(1989) Standard Specifications for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
ASTM F 442	(1989) Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)

1.4.1 Manufacturer's Catalog Data

a. Plastic Pipe, Fittings and Valves

1.4.2 SD-04 Drawings

Installation drawings for Plastic Piping Systems shall be submitted with the other drawings and shall be in accordance with the paragraph entitled, "Installation," of this section. Installation drawings shall be based on the equipment and instrumentation actually provided.

1.4.3 Test Procedures

PART 2 PRODUCTS

2.1 POLYVINYLCHLORIDE (PVC) PIPE

PVC pipe shall be in accordance with ASTM D 1785.

2.1.1 Schedule Pipe (PVC)

Pipe shall be Schedule 80.

Material shall be PVC Class 12454-B in accordance with ASTM D 1784.

2.1.3 Fittings (PVC)

2.1.3.1 Socket-Type, Schedule 40

Material shall be PVC in accordance with ASTM D 2466.

2.1.3.2 Socket-Type, Schedule 80

Material shall be PVC in accordance with ASTM D 2467.

2.1.3.3 Threaded, Schedule 80

Material shall be PVC in accordance with ASTM D 2464.

2.1.4 Cement and Lubricant

Solvent cement for pipe and fittings shall be in accordance with ASTM D 2564 . Thread lubricant shall be in accordance with the pipe manufacturer's recommendations.

2.2 CHLORINATED POLYVINYLCHLORIDE (CPVC) PIPE

CPVC pipe shall be in accordance with ASTM F 441.

2.2.1 Schedule Pipe (CPVC)

Pipe shall be Schedule 80.

Material shall be CPVC Class 23447-B in accordance with ASTM D 1784.

2.2.3 Fittings (CPVC)

2.2.3.2 Socket-Type, Schedule 80

Material shall be CPVC in accordance with ASTM F 439.

2.2.3.3 Threaded Schedule 80

Material shall be CPVC in accordance with ASTM F 437.

2.2.4 Cement and Lubricant

Solvent cement for pipe and fittings shall be in accordance with ASTM D 2564

Thread lubricant shall be in accordance with the pipe manufacturer's recommendations.

2.4 ACRYLONITRILE-BUTADIENE-STYRENE (ABS) PIPE

2.4.1 Schedule Pipe (ABS)

ABS schedule pipe shall be in accordance with ASTM D 1527.

Pipe shall be Schedule 80.

Pipe shall be ABS 1210.

2.4.3 Threaded Pipe

Threaded pipe shall be in accordance with ASTM D 1527.

Pipe shall be ABS 1210.

2.4.7.2 Schedule 80, Socket-Type

Schedule 80, socket-type fittings shall be in accordance with ASTM D 1527.

Fittings shall be Type I, Grade 1.

2.4.7.3 Schedule 80, Threaded

Schedule 80, threaded fittings shall be in accordance with ASTM D 1527.

Fittings shall be Type I, Grade 1.

2.4.8 Cement and Lubricant

Solvent cement for pipe and fittings shall be in accordance with ASTM D 2235
Thread lubricant shall be in accordance with the pipe manufacturer's instructions.

2.3.4 Pipe Thread Tape

Antisieze and sealant tape shall be polytetrafluoroethylene (PTFE).

2.3.5 Flanges

Flange material shall be the same as the pipe to which it is attached. All

flange facings and drilling patterns shall conform to ANSI B16.5 flat face.

2.3.6 Flange Bolting

All flange bolting shall be ASTM A193, Grade B8, Class 1 studs with ASTM A194, Grade 8 heavy hex nuts and Type 304 stainless steel flat washers.

2.3.7 Flange Gaskets

Flange Gasket Material shall be ASTM F152 Neoprene, 1/8" thick. Cut gaskets to match flange facings as required or provide pre-cut gaskets. All flange gaskets shall be full face type.

2.4.9 Valves

Valves shall be of the size and type indicated on the drawings and in the Valve List. Materials and pressure rating shall match the connected piping. Unless otherwise indicated or required for equipment connection, valves shall be union both ends.

Ball valves shall be full port with tee hands.

PART 3 EXECUTION

3.1 PIPE LAYOUT

Installation shall present a neat, orderly appearance. Openings or passageways shall not be blocked.

Piping shall be located and routed as shown on the drawings.

3.2 INSTALLATION

Plastic piping shall be installed in accordance with the manufacturer's installation instructions.

3.2.1 Vertical Piping

Piping shall be supported at intervals of not more than four feet.

Piping shall be secured at sufficiently close intervals to keep pipe in alignment and to support weight of pipe and contents.

Piping shall be secured in position by approved stakes or braces when piping is to stand free, or when no structural element is available for providing stability during construction.

3.2.2 Horizontal Piping, Suspended

All piping shall be supported at intervals in accordance with the manufacturer's instructions and in no case more than five feet.

Hangers shall be installed at ends of runs or branches and at each change of direction or alignment.

3.2.4 Cutting

Cuts shall be made square with pipe and burrs shall be removed by smoothing edges.

3.2.5 Joints

Threaded joints shall be used only where indicated on drawings or required

for instruments and equipment. Joints shall be tightened in accordance with the manufacturer's instructions. Thread sealant tape shall be used on all threaded joints.

Junction with other materials shall be the type of adapter as shown on the drawings or as recommended by the pipe manufacturer.

Joints shall be solvent cemented in accordance with ASTM D 2855.

Flange bolting shall be tensioned by torque in accordance with flange manufacturer's instructions. Apply a stainless steel compatible antsieze compound to stud threads before installing nuts.

3.3 FIELD QUALITY CONTROL

3.3.1 Inspections

Prior to initial operation, inspect piping system for compliance with drawings, specifications and manufacturer's submittals.

3.3.2 Field Testing

Before final acceptance of the work, test each system in accordance with approved test procedure to demonstrate compliance with the contract requirements. Correct the defects in the work provided by the Contractor, and repeat tests until work is in compliance with contract requirements. Furnish water, electricity, instruments, connecting devices and personnel for performing tests. Perform testing in accordance with the Contractor prepared procedures approved by the Contracting Officer.

3.3.3 Process Piping

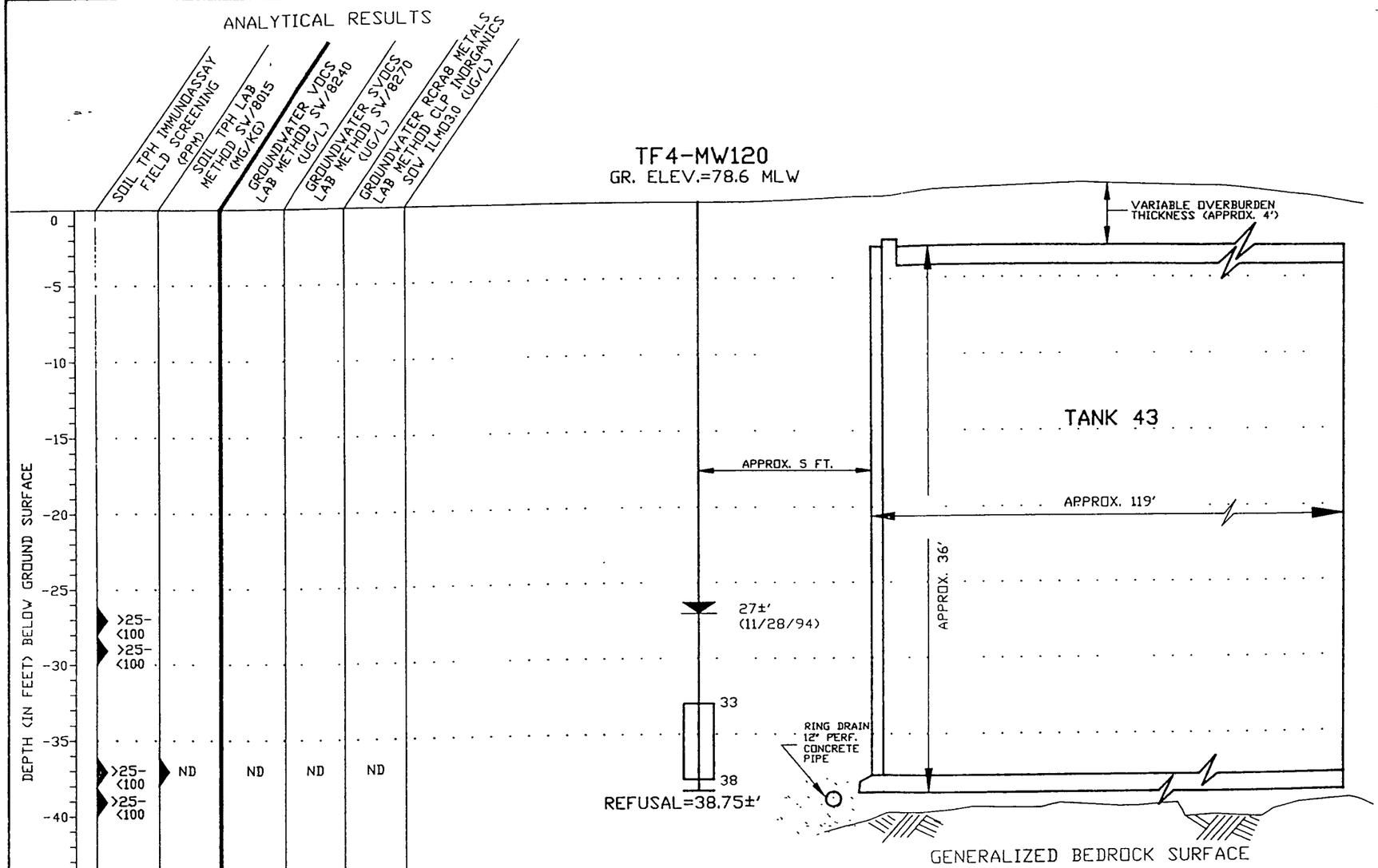
Hydrostatically test all process piping at not less than 75 psig with no leakage or reduction in gage pressure for 2 hours. Where piping cannot be isolated for pressure test, leak test at conditions equivalent to operating conditions.

-- End of Section --

APPENDIX B

TANK FARM 4 UST ELEVATION DATA

UST-43 (Influent Tank)
UST-44 (Effluent Tank)



LEGEND

▼	WATER TABLE (FEET BELOW GROUND SURFACE)
1 / 2	MONITORING WELL SCREEN DEPTH (FEET BELOW GROUND SURFACE)
UG/L	MICROGRAMS PER LITER
PPM	PARTS PER MILLION
MG/KG	MILLIGRAMS PER KILOGRAM
MG/L	MILLIGRAMS PER LITER
TPH	TOTAL PETROLEUM HYDROCARBON
VOCS	VOLATILE ORGANIC COMPOUNDS
SVOCS	SEMI-VOLATILE ORGANIC COMPOUNDS
TF4	TANK FARM 4
MW101	GROUNDWATER MONITORING WELL NO.
MLW	MEAN LOW WATER
ND	NOT DETECTED

DATA SHEET – TANK 43

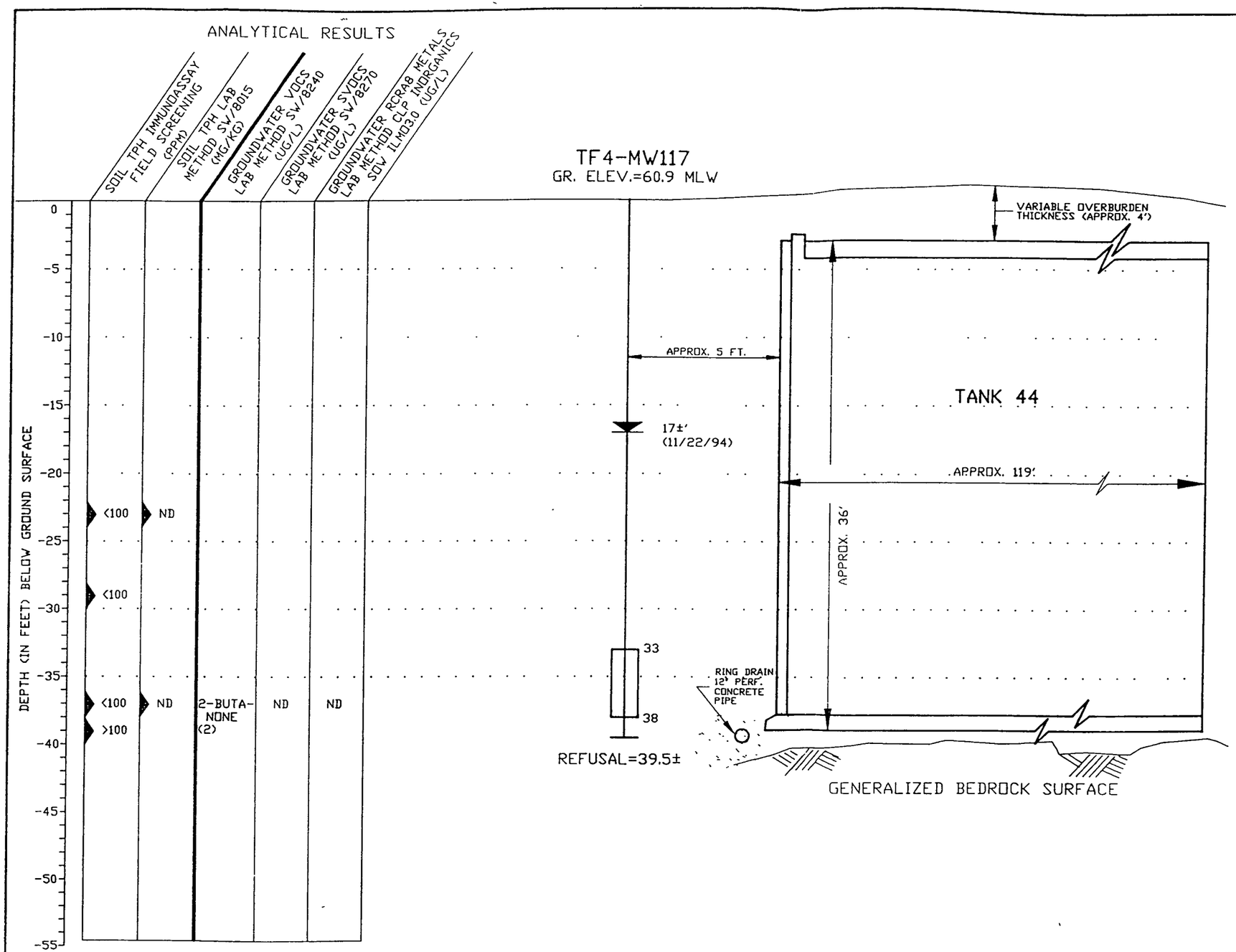
NETC–NEWPORT, RI

PRELIMINARY CLOSURE ASSESSMENT REPORT

DRAWN BY:	R.G. DEWSNAP	REV:	1
CHECKED BY:	J.B. HOLDEN	DATE:	5 JUN 95
SCALE:	1" = 8' (APPROX.)	FILE NO.:	C:\DWG\NETC\FIG_3-7

FIGURE 3-7

Halliburton NUS CORPORATION
55 Jonspin Road Wilmington, MA 01887
(508)658-7899



LEGEND

▼	WATER TABLE (FEET BELOW GROUND SURFACE)
1 / 2	MONITORING WELL SCREEN DEPTH (FEET BELOW GROUND SURFACE)
UG/L	MICROGRAMS PER LITER
PPM	PARTS PER MILLION
MG/KG	MILLIGRAMS PER KILOGRAM
MG/L	MILLIGRAMS PER LITER
TPH	TOTAL PETROLEUM HYDROCARBON
VOCS	VOLATILE ORGANIC COMPOUNDS
SVOCS	SEMI-VOLATILE ORGANIC COMPOUNDS
TF4	TANK FARM 4
MW101	GROUNDWATER MONITORING WELL NO.
MLW	MEAN LOW WATER
ND	NOT DETECTED

DATA SHEET – TANK 44

NETC–NEWPORT, RI

PRELIMINARY CLOSURE ASSESSMENT REPORT

DRAWN BY	R.G. DEWSNAP	REV.:	1
CHECKED BY	J.B. HOLDEN	DATE:	5 JUN 95
SCALE:	1" = 8' (APPROX.)	FILE NO.:	C:\DWG\NETC\FIG_3-8

FIGURE 3-8

Halliburton NUS CORPORATION
55 Jonspin Road Wilmington, MA 01887
(508)658-7899

TABLE 15

NETC-T, ARM FIVE
SUMMARY OF MISCELLANEOUS PARAMETERS
IN WATER SAMPLES
FEBRUARY 1994

COMPOUND (ppm)	Tank 49	Tank 50	Tank 51	Tank 52	Tank 54	Tank 55	Tank 57	Tank 58	Tank 59
Hardness	156	585	325	954	294	228	178	127	143
Alkalinity	143	347	115	231	67	92	80	61	75
Total Suspended Solids	12	16	42	94	4.0	4.0	5.0	<1.0	<1.0
Total Dissolved Solids	227	2470	597	5560	263	408	221	183	204
Total Organic Carbon	16	12	22	128	165	11	15	356	267
COD	460	368	460	1330	276	184	37	46	28
BOD5	176	42	206	186	55	206	42	45	36
Ammonia (N)	<0.1	0.59	0.11	2.3	0.13	0.17	<0.1	0.3	0.15
Total Phosphorus	0.075	0 65	0.35	1.0	0.11	0.25	0.025	0.05	0.038
Oil and Grease	93	3.4	80	84	84	19	6	8.4	2.2
Surfactants	0.13	0.62	0.74	1.6	0.42	0.70	0.2	0.09	0.11
Phenols	0.15	0.36	0.75	0.52	0.1	0.4	0.05	<0.02	0.08
Fecal Coliform, MPN/100 ml	<2	<2	<2	<2	<2	8	2	7	<2
Nitrate-Nitrite (N)	0.05	<0.05	0.10	0.07	<0.05	<0.05	0.07	0.05	0.10
Sulfate	<1.0	47	11	1.0	1.0	3.0	2.0	8.0	5.0
Sulfide	0.05	4.0	0.1	50	0.135	0.02	<0.02	0.15	0.54
Total Cyanide	<.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

TABLE 3

NETC – ARM FIVE
SUMMARY OF COMPOUNDS DETECTED
IN WATER SAMPLES
FEBRUARY 1994

COMPOUND (ppb)	Tank 49	Tank 50	Tank 51	Tank 52	Tank 54	Tank 55	Tank 57	Tank 58	Tank 59	Reporting Limit
VOLATILE ORGANICS										
Benzene	ND	29	2.03	41	ND	2.22	ND	ND	10	1
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	3.49	1
1,1-Dichloroethane	ND	2.48	5.15	20	ND	1.67	ND	ND	ND	1
cis-1,2-Dichloroethene	ND	1.53	11	2.51	ND	7.95	ND	ND	ND	1
trans-1,2-Dichloroethene	ND	ND	2.36	ND	ND	1.70	ND	ND	ND	1
Ethylbenzene	ND	22	1	30	ND	ND	ND	ND	1.93	1
Toluene	ND	40	3	26	1.06	7.28	ND	ND	1.84	1
Trichloroethene	ND	ND	ND	1.91	ND	ND	ND	ND	ND	1
Vinyl Chloride	ND	17	568	134	56	417	ND	ND	ND	20
Xylene, Total	ND	104	20	141	3.69	34	2.24	3.20	86	1
SEMIVOLATILE BASE/NEUTRAL EXTRACTABLES										
Acenaphthene	6.08	47	1.81	4.56	14	5.56	2.79	1.74	1.43	1
Anthracene	4.96	26	ND	1.35	7.73	2.93	ND	ND	ND	1
Benzo (a) anthracene	ND	1.04	ND	1.93	ND	ND	ND	ND	ND	1
Bis (2-ethylhexyl) phthalate	ND	ND	ND	ND	7.04	5.68	3.15	7.88	ND	1
Chrysene	ND	1.99	ND	ND	ND	ND	ND	ND	ND	2
Dibenzofuran	6.93	32	1.99	3.76	ND	4.86	2.40	ND	ND	2
Di-n-Butylphthalate	ND	ND	ND	ND	ND	ND	1.05	ND	ND	1
Fluoranthene	ND	3.09	ND	ND	ND	ND	ND	ND	ND	1
Flourene	15	90	3.45	8.21	14	11	5.17	3.45	2.32	1
2-Methylnaphthalene	16	98	59	84	4.50	74	7.50	7.77	59	1
Naphthalene	10	33	50	69	5.93	39	4.44	5.50	63	1
Phenanthrene	17	76	1.84	8.27	16	7.75	2.29	1.79	1.95	1
Pyrene	ND	8.63	ND	2.10	ND	1.30	ND	ND	ND	1
SEMIVOLATILE ACID EXTRACTABLES										
2,4-Dimethylphenol	ND	55	28	8.18	6.98	8.64	2.89	2.49	8.57	1
2-Methylphenol	ND	ND	87	7.67	1.64	42	ND	ND	ND	1
4-Methylphenol	ND	ND	38	ND	1.07	18	ND	ND	ND	1
Phenol	ND	ND	83	ND	ND	35	ND	ND	ND	1

TABLE 3

TANK FARM 4
SUMMARY OF POSITIVE CONTAMINANT DETECTIONS IN GROUNDWATER SAMPLES
DECEMBER 1994

TANK	MONITORING WELL	CONTAMINANT(S)	CONCENTRATION(S)
Tank 37	MW124	Mercury	1.0 ppb
Tank 38	MW125	1,1,2,2-Tetrachloroethane	1.0 ppb
		Fluorene	20.0 ppb
		Phenanthrene	48.0 ppb
		Pyrene	28.0 ppb
		Chrysene	23.0 ppb
Tank 39	MW115	2-Butanone	2.0 ppb
Tank 40	MW114	No Positive Detects	-
Tank 41	MW116	2-Butanone	2.0 ppb
Tank 42	MW123	Arsenic	33.0 ppb
		Chromium	25.8 ppb
		Lead	16.0 ppb
Tank 43	MW120	No Positive Detects	-
Tank 44	MW117	2-Butanone	2.0 ppb
Tank 45	MW122	Fluorene	16.0 ppb
		Phenanthrene	15.0 ppb
		Pyrene	15.0 ppb
		Arsenic	656 ppb
		Barium	1530 ppb
		Chromium	496 ppb
		Lead	722 ppb
		Mercury	0.52 ppb
		Silver	29.0 ppb
Tank 46	MW121	Arsenic	12.6 ppb
		Barium	51.4 ppb
		Chromium	5.2 ppb
		Lead	11.8 ppb
Tank 47	MW118	2-Butanone	2.0 ppb
Tank 48	MW119	Naphthalene	1.0 ppb
		2-Methylnaphthalene	7.0 ppb
		Dibenzofuran	1.0 ppb
		Fluorene	2.0 ppb
		Phenanthrene	3.0 ppb
		Pyrene	2.0 ppb
		Mercury	0.42 ppb

APPENDIX C

TANK FARM 4 GAUGING REPORT

Halliburton NUS
CORPORATION

55 Jonspin Road
Wilmington, MA 01887

(508) 658-7899
FAX (508) 658-7870

TO: D LEADENHAM

C-52-3-5-2185W

March 21, 1995

Project Number 0288

Mr. Brian Helland
Northern Division, Code 1811
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, Pennsylvania 19113

Reference: Contract No. N62472-90-D-1298 (CLEAN)
Contract Task Order No. 143

Subject: Transmittal of Results of Tank Gauging At Tank Farm 4, NETC-Newport, Rhode Island

Dear Mr. Helland:

Find enclosed four copies of the Results of Tank Gauging at Tank Farm 4, NETC- Newport, Rhode Island. Distribution has been made to the personnel listed below.

If you have any questions or comments concerning the report, please do not hesitate to contact me at (508) 658-7899.

Very truly yours,

Walter J. Martin
Project Manager

WJM:gmdb

Enclosure

cc: D. Dorocz (NETC) Code 40E w/enc.
J. Trepanowski/M Turco (HNUS) w/enc
File 0288-3.2 w/o enc.
File 0288-2.1 w/enc

RESULTS OF TANK GAUGING
TANK FARM 4
CTO 143
NETC-NEWPORT

1.0 INTRODUCTION

Halliburton NUS Corporation conducted Tank Gauging activities from February 27 through March 3, 1995 at Tank Farm 4 located at NETC -Newport, Rhode Island. The work was authorized under the Record of Change Memorandum dated January 19, 1995. Level of effort and budget estimates were reported to the Navy in Cost Impact Letter No. 2 addendum dated February 20, 1995.

This letter report addresses gauging the thickness of oil, water and sludge layers in each of twelve underground storage tanks located at Tank Farm 4 (Tanks 37 - 48). The volume of each phase present in the tanks was also estimated. Several methods were used to accurately gauge the three phase layers: a weighted tape was used to measure the depth to the top of the oil layer; a customized colliwasa sampler, an M-scope, and a viscosity meter were used to measure the bottom of the oil layer; and a dipstick was used to measure the sludge layer and the overall tank depth. The depth of the water layer was arithmetically estimated from the previous measurements. The following discussion presents the gauging methods and health and safety procedures employed during conduct of this task.

2.0 GAUGING METHODOLOGY

The tank gauging was conducted at the manholes located inside of the tank manways. A reference point for gauging measurements was established at the edge of each manhole; and the distance from the reference point to the top of the tank ceiling was measured. Measurements were collected at one location at each tank. All measurements were recorded by the task manager, and the thickness of each layer was estimated prior to completing work at each tank. If a measurement discrepancy was apparent, the measurement was checked, and the thickness of each layer was recalculated.

2.1 MEASUREMENT TO TOP OF TANK CONTENTS

The distance to the surface of the top oil phase was measured using a weighted tape. The tape was lowered into the tank until it touched the surface of the top tank phase. The measurement was made with reference to the established reference point.

The level of confidence of this measurement is high because the measurement process could be visually monitored and controlled.

2.2 MEASUREMENT OF THE OIL/WATER INTERFACE

Several methods were used to determine the thickness of the upper oil layer. This layer is typically extremely viscous. In some cases, it was observed by the field crew, that where the oil layer was punctured by a probe point, a 2 inch diameter hole caused by the point remained open overnight. The high viscosity of this layer resulted in fouling and failure of some gauging equipment

Water Level Indicator (M-scope)

The following procedure was routinely used to isolate monitoring equipment from the upper oil layer to prevent smearing of oil on the equipment while raising and lowering of the equipment through the oil layer.

One end of a large diameter (1.25 inch or 1.5 inch) PVC pipe was closed off with aluminum foil and lowered through the upper oil into the water phase. The PVC pipe served to isolate the M-scope from the upper oil so that the scope remained clean. The probe was lowered through the PVC into the water layer, at which time the PVC pipe was retracted from the tank. The probe was raised and the depth of the bottom surface of the top oil phase was recorded as indicated by the meter.

The viscosity meter was used to confirm measurements made with the M-scope method. Results of the field confirmation indicated the M-scope method was indicating a significantly thinner oil layer than was measured with the viscosity meter.

Apparently, the "borehole" created by the PVC pipe did not collapse after retraction of the pipe. The hole in the viscous oil remained open following retraction of the PVC pipe and filled with a minimal quantity of liquid phase petroleum, and water. The thickness of liquid phase oil filling the borehole was considerably thinner than the oil layer. As the M-scope was retracted through the "borehole," the true thickness of the upper oil was not registered.

The oil layer was gauged in four tanks prior to identification of the problem and the M-scope method was not used after that time. The oil layer in the four tanks was later regauged using the viscosity meter method.

Customized Coliwasa Sampler

An attempt was made to gauge the thickness of the oil layer with a coliwasa sampler. A customized coliwasa sampler was constructed using transparent acetate (1.75 inch inside diameter) pipe so that the oil thickness could be measured directly from the oil recovered in the sampler.

The pipe was lowered through the upper oil into the water phase and the bottom end was plugged with a remotely operated stopper. The coliwasa was then retracted from the tank and handled in a manner to keep the pipe in a vertical position. The outside of the apparatus was wiped clean using a petroleum absorbent pad to allow for a visual observation of the top oil phase thickness.

This method was not effective because of the high viscosity of the top oil phase. The oil did not readily flow into the 1.75 inch diameter acetate pipe and this method was not used.

Viscosity Meter

A small, 1.5 volt battery powered propeller unit was hard wired to a power source and an ampmeter to detect the lower oil layer surface. The propeller unit draws a significantly higher amperage while operating in the viscous oil than in the underlying water layer. By advancing the unit through the oil and into the water, the change in amperage can be noted on the ammeter. The decrease in amperage indicates the oil/water interface.

The potentiometer was secured to the bottom end of the small diameter PVC pipe. Electrical wire was threaded through PVC pipe, connecting the propeller to a 1.5 volt battery and a multimeter. The propeller was powered and then slowly pushed through the top phase of oil. Once the potentiometer

passed through the oil into the water phase, the amperage significantly dropped and the length of pipe was measured to the reference point.

The distance from the top of the tank to the top of the tank contents was then subtracted from the length of pipe required to reach the oil/water interface. The resulting calculation represents the estimated thickness of the top oil phase.

This method was successful and was repeated two to three times at each tank in order to evaluate the reproducibility of the method. Results of this QC indicated that measurements could be repeated to an accuracy of 0.25 of a foot. This accuracy would result in a volume estimate accurate to within an estimated 20,000 gallons, assuming a uniform thickness of oil across the tank.

2.3 MEASUREMENT OF THE BOTTOM SLUDGE

One end of a large diameter (1.25 or 1.5 inch) PVC pipe was sealed with aluminum foil and lowered through the upper oil into the water phase. A smaller diameter (0.5 inch) PVC pipe was lowered through larger PVC, pushed through the aluminum foil, into the water phase to the bottom of the tank. The larger PVC pipe served to isolate the smaller pipe from the upper oil so that oil did not smear the small diameter pipe. The overall depth of the tank (to the reference point) was marked on the small PVC pipe, which was then retrieved through the large diameter PVC. Bottom sludge adhered to the PVC pipe. The thickness of the bottom sludge and overall tank depth were measured directly from the small diameter PVC.

The level of confidence of this measurement is high, because the volume is estimated based on a taped measurement of oil adhering to the PVC pipe. The variable which may introduce error into this measurement is a variable thickness of sludge may be present across the tank bottom resulting from the pitched tank floor. It was not the purpose of this task to evaluate this condition, and no effort was made to determine the potential error caused by a pitched tank floor.

2.4 ESTIMATION OF THE THICKNESS OF THE WATER PHASE

The estimated thickness of the water layer was determined by subtracting the thickness of the upper oil and bottom sludge layers from the total thickness of the tank contents.

The level of confidence of this estimation is a function of the accuracy of the estimation of the volume of oil because the estimation of the volume of water is made by subtracting the total estimated oil and sludge volume from the volume of the total tank contents.

3.0 HEALTH AND SAFETY

HNUS classified the tank manways as Permit-Required Confined Spaces and, therefore, all entry work was conducted in compliance with the OSHA regulation 29 CFR 1910.146. The majority of the work was conducted in Level D respiratory protection, however, there were several upgrades to Level C (air-purifying full-face cartridge respirator). In summary, entry into each tank required:

- completion of a confined space entry permit
- an Attendant on duty
- initial and periodic air monitoring using an O_2/LEL meter, PID, H_2S Minicheck, and Drager tubes (benzene)
- entrants use of a body harness and lifeline
- assorted PPE (PE-coated coveralls, rubber boots or waders, latex gloves, and hardhat)

4.0 CONCLUSIONS

The results of the gauging measurements and volume estimates are presented in Table 1. All twelve tanks have a minimum of two phase layers, oil and water. The sludge layer was not detected in two tanks, 41 and 45.

FIGURE 1
CTO 143 – TANK FARM 04 TANK PHASE
VOLUME ESTIMATE
HALLIBURTON NUS CORPORATION

	TANK			HEADSPACE	OIL		WATER		SLUDGE		TOTAL LIQUIDS		
	DIAMETER	DEPTH (ft)	VOL. (gal)	DEPTH (ft)	DEPTH (ft)	VOL. (gal)	DEPTH (ft)	VOL. (gal)	DEPTH (ft)	VOL. (gal)	DEPTH (ft)	VOL. (gal)	DATE
TANK 37	116	33.54	2635607.88	18.62	0.51	40076	14.26	1120566	0.15	11787	14.92	1172429	03/02/95
TANK 38	116	33.6	2640322.74	6.21	0.61	47934	26.66	2094970	0.12	9430	27.39	2152335	03/02/95
TANK 39	116	33.93	2666254.48	5.48	0.96	75438	25.54	2006960	1.95	153233	28.45	2235630	02/28/95
TANK 40	116	33 55	2636393.69	0.63	2.75	216098	30.15	2369218	0.02	1572	32.92	2586888	03/01/95
TANK 41	116	33.57	2637965.31	21.25	1.3	102155	11.02	865963	0	0	12.32	968118	03/02/95
TANK 42	116	33.57	2637965.31	26.62	0.65	51078	6.28	493489	0.02	1572	6.95	546138	03/03/95
TANK 43 (1)	116	33.56	2637179.5	14.8	1.62	127301	16.89	1327234	0.25	19645	18.76	1474180	02/28/95
TANK 44 (2)	116	33.62	2641894.36	14.42	1.73	135945	17.37	1364953	0.1	7858	19.2	1508756	03/02/95
TANK 45	116	32.59	2560955.9	22.65	0.6	47149	9.34	733947	0	0	9.94	781095	03/01/95
TANK 46	116	33.58	2638751.12	23.87	0 71	55793	8.99	706443	0.01	786	9.71	763022	03/03/95
TANK 47	116	33.46	2629321.4	22.505	0.47	36933	10.36	814100	0.125	9823	10.955	860855	02/27/95
TANK 48	116	33.57	2637965.31	13.07	0.95	74652	19.5	1532330	0.05	3929	20.5	1610911	02/28/95

NOTES:

(1) TANK 43 - INFLUENT TANK TO BE USED AS-IS.

(2) TANK 44 - EFFLUENT TANK TO BE CLEANED PRIOR TO UTILIZATION

Note: The oil values for Tanks 43, 47, and 48 were sampled on 03/03/95

ATTACHMENT B

PRICE QUOTATION FORM

#	ITEM DESCRIPTION	UNIT PRICE	NO. UNITS	TOTAL PRICE
1	Submittal and acceptance of the design submittal for the Wastewater Treatment System.	Lump Sum	1	$_____
2	Rent/Lease Skid Mounted Treatment System units w/all hosing, valves, and controls.	$_____/month/unit $_____/Day/unit	21 0	$_____ $_____
3	Mobilization	$_____/unit	3	$_____
4	Servicing Unit	$ _____/month/unit	21	$_____
5	Training	$ _____/8-hour day	1	$_____
6	Activated Carbon Recharge, Disposal and/or Regeneration	$ _____/Unit/Month	21	$_____
7	Decontamination and Demobilization	$_____/unit	3	$_____

Option:

8	Purchase Skid Mounted Treatment System units w/all hosing, valves, and controls.	$_____/unit	3	$_____

ATTACHMENT A

UNITED STATES NAVY CONTRACT NO. N62472-94-D-0398
DELIVERY ORDER NO. 013
REMEDIAL ACTION CONTRACT

STATEMENT OF WORK
FOR
CHAIN LINK FENCE
TANK FARM 4
NAVAL EDUCATION AND TRAINING CENTER (NETC)
Newport, Rhode Island

SOW-1284-13-01

MARCH 1996

Prepared by

Foster Wheeler Environmental Corporation
470 Atlantic Avenue
Boston, MA 02210

Revision	Date	Prepared By	Approved By	Pages Affected
Rev. A	4/4/96	F.P. Zizzo	M. Zizza	All

TABLE OF CONTENTS

FIGURES

1.0 GENERAL DESCRIPTION

1.1 Purpose

This Statement of Work (SOW) provides the Subcontractor with a description of fencing installation services required to support remediation activities at the U.S. Navy Northern Division (the Navy) Naval Education and Training Center (NETC) Tank Farm 4, located in Portsmouth, Rhode Island (the Site).

The necessary services will consist of erecting a new chain link fence with a 20-foot gate, and repair of existing chain link fence where its integrity has been compromised. All work related to this SOW will be performed under the technical direction of Foster Wheeler Environmental Corporation (Foster Wheeler Environmental).

1.2 Site Location

The Site is located approximately 25 miles southeast of Providence, Rhode Island in the Town of Portsmouth, Rhode Island (Newport County) as shown in Figure 1-1. The Defense Highway is to the north/northwest of the Site, a residential area is located to the southeast of the Site, and undeveloped woodlands are located north/northeast of the Site. Narragansett Bay is located 500 to 1,000 feet to the west, and Norman's Brook is located southwest of the Site. Located to the south and to the north are NETC Tank Farm 5 and Tank Farm 3, respectively. Refer to Figure 1-2 for the Site Plan.

1.3 Project Description

The NETC Tank Farm 4 consists of approximately 90 acres of open land containing 12 large reinforced concrete underground storage tanks (USTs) owned and controlled by the Navy. The tank farm was constructed by the Navy in 1941 and was used to store liquid petroleum products. However, the USTs have not been in use since the 1970s.

In 1992, the State of Rhode Island enacted UST regulations, and therefore the USTs at NETC Tank Farm 4 became subject to the closure requirements contained within the UST regulations. The Navy initiated the process for permanent closure of the USTs, and in 1996 Foster Wheeler Environmental was selected as the Contractor to complete the closure of the USTs in NETC Tank Farm 4. Closure activities will include removal of all contents from the USTs and cleaning and repairing the USTs. The contaminants of concern at the Site are those associated with petroleum based products and asbestos pipe insulation.

Other Site structures include a decommissioned electrical substation, and an abandoned oil-water separator. A paved access road leads into the Site and loops around the Site providing access to the USTs. The outer perimeter of the Site is covered with dense brush and is heavily wooded. A perimeter fence surrounds the Site along three (3) sides and most of the Site is covered with tall grass, dense brush, and small diameter trees.

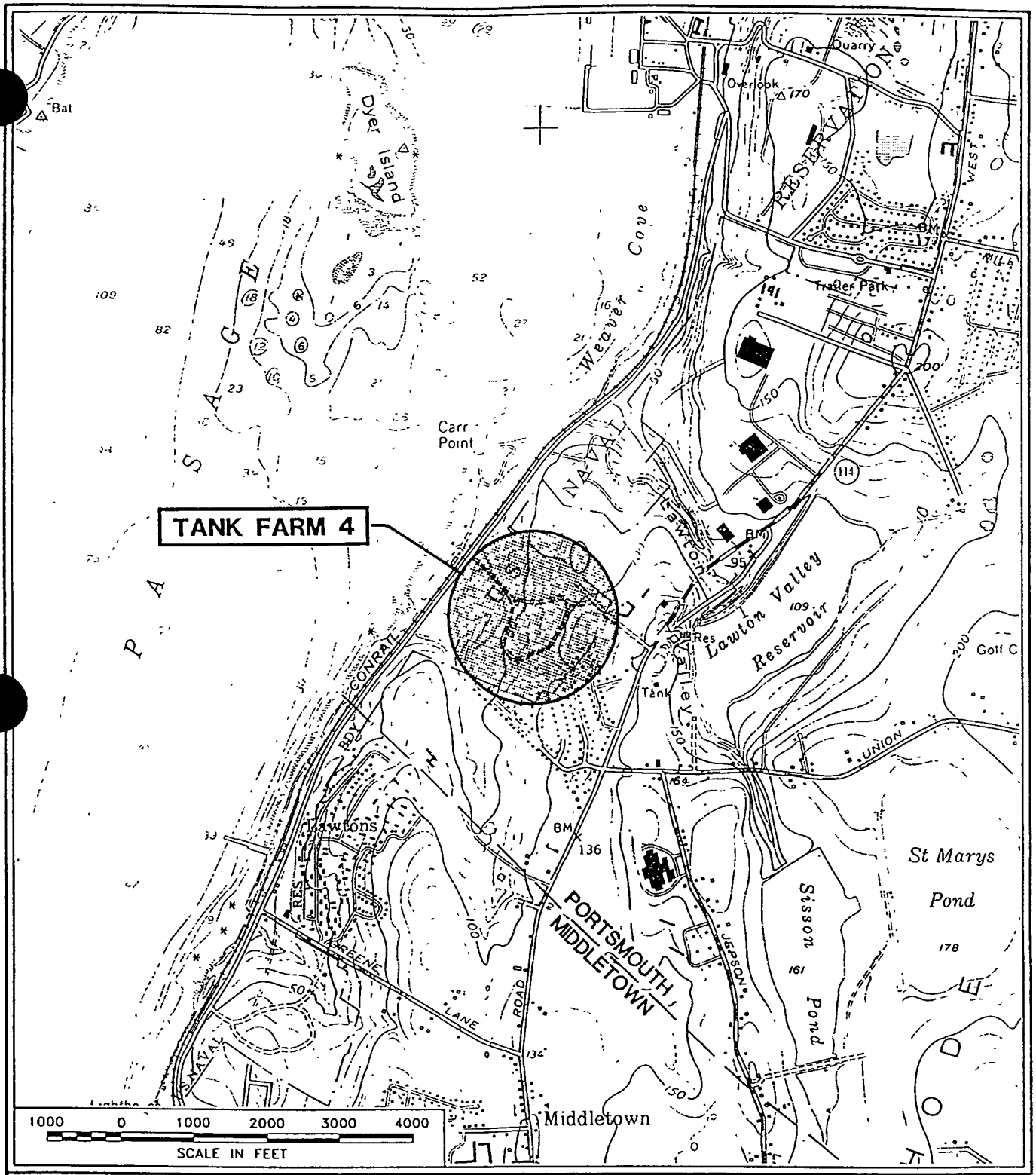


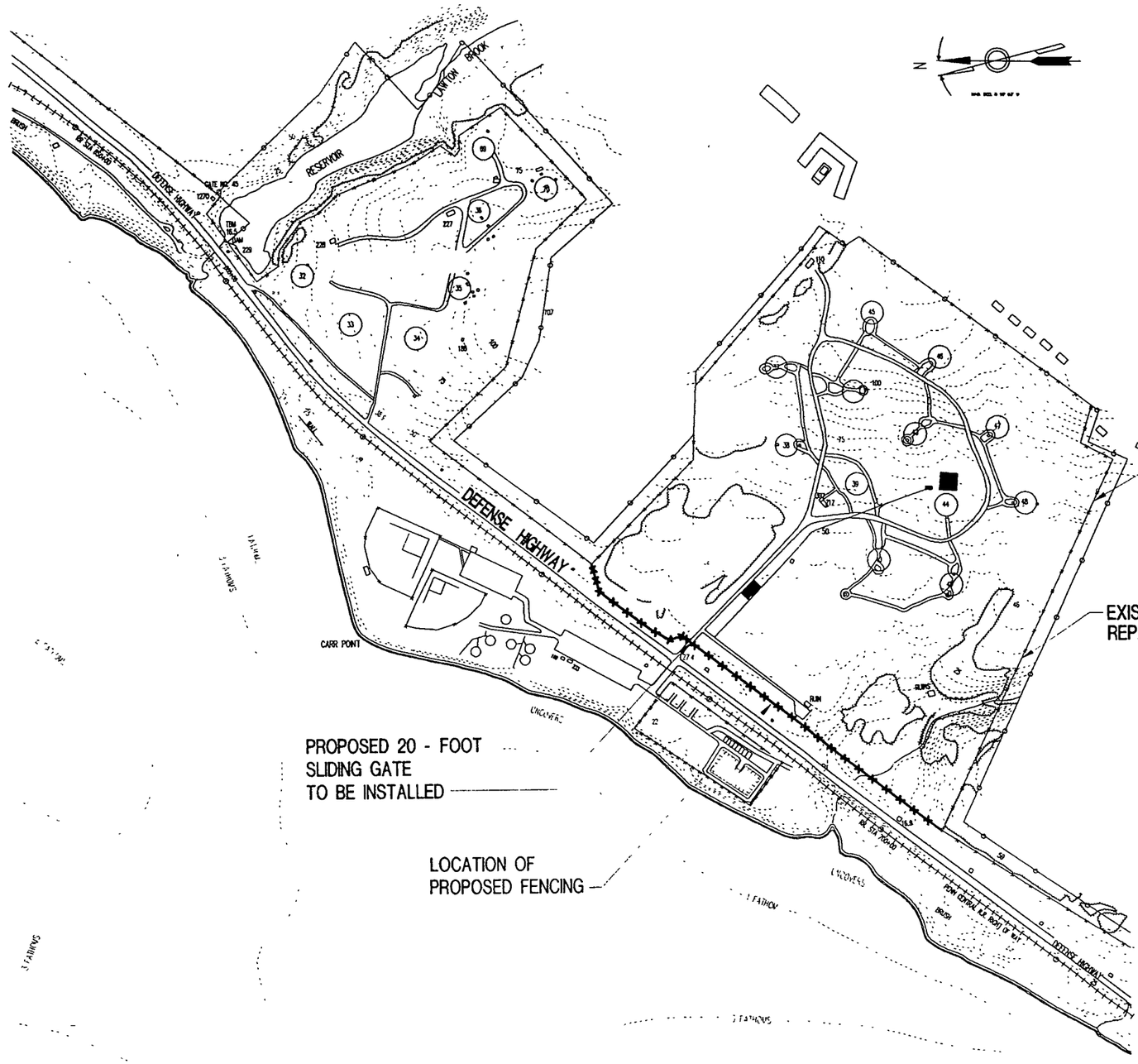
FIGURE 1-1

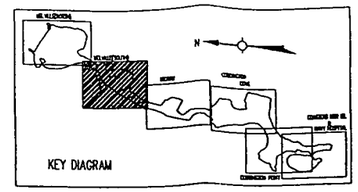
Naval Education and Training Center
Newport, Rhode Island

SITE LOCATION MAP

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE 1284FG11.DWG





LEGEND

- BUILDING OR STRUCTURE
- ROAD OR PAVED AREA
- TRAIL OR EARTH ROAD
- PROPERTY BOUNDRY & FENCE LINE
- NAVY PROPERTY BOUNDRY LINE
- RESERVATION BOUNDRY
- RAILROAD
- STREAM
- SHORE LINE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- DEPRESSION CONTOUR
- SPOT GRADE ELEVATION OR SPOT
- WOODED AREA
- MARSH LAND
- EXISTING FENCE
- PROPOSED FENCE

PREPARED BY

FOSTER WHEELER ENVIRONMENTAL CORPORATION
[illegible] AVENUE BOSTON, MASSACHUSETTS 02210

BASE MAP REFERENCE

MELVILLE SOUTH EXISTING CONDITIONS MAP, NETC DWG 31062-307
UPDATED FROM THE DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND EDUCATION AND TRAINING CENTER NEWPORT RHODE ISLAND

FIGURE 1-2

Naval Education and Training Center
Newport, Rhode Island

SITE PLAN

SCALE: AS SHOWN	PROJ. NO. 1284.0013.0103

CADFILE 1284FG12.DWG
DATE 4/3/96

1.4 Definitions

1.4.1 The Term "Subcontractor"

The term "Subcontractor" shall mean the person, persons, partnership, corporation, or business organization engaged on behalf of Foster Wheeler Environmental pursuant to a contract for performance of work described in this SOW.

1.4.2 The Term "Contractor"

The term "Contractor" shall mean Foster Wheeler Environmental or the person delegated responsible charge of work by Foster Wheeler Environmental, or its authorized agents and assistants, acting jointly or severally within the scope of the particular duties and authorities delegated to them.

2.0 SCOPE OF WORK

The work to be accomplished by the Subcontractor under this task includes all supervision, labor, equipment, tools, and materials required for the installation of a permanent chain link fence and repair of existing chain link fence. The fence shall be shall be a 7-foot chain link fence with an additional three (3) rows of barbed wire along the top of the fence. The fence shall be installed along the Site's edge adjacent to Defense Highway. The Subcontractor shall attach the fence to the existing fence installed along the other three sides of the Site's perimeter. The proposed fence is approximately 2,100 linear feet with a 20-foot single sliding gate at the access road to the Site. Refer to Figure 2-1.

2.1 Deliverable Requirements

Upon contract award, the Subcontractor shall submit manufacturer's technical data and installation instructions for metal fence posts, fabric, gates, barbed wire, and accessories to meet or exceed quality of existing Site fencing and barbed wire.

3.0 CODES AND STANDARDS

The Subcontractor shall comply with all applicable federal, state, and local regulations with regard to fence installation. All field activities shall be conducted in an efficient and professional manner. If any conflicts exist between any codes, standards, or specific requirements of this SOW, the most stringent shall always apply.

3.1 References

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

American Society for Testing and Materials (ASTM)

ASTM C 94	(1990) Ready-Mixed Concrete
ASTM F883	(1990) Padlocks

American Welding Society (AWS):

AWS WZC	(1972) Welding Zinc-Coated Steels

Federal Specifications (FS):

FS RR-F-191/GEN	(Rev K) Fencing, Wire and Post Metal (and Gates, Chain-Link Fence Fabric, and Accessories)
FS RR-F-191/1	(Rev D) Fencing, Wire and Post, Metal (Chain-Link Fence Fabric)
FS RR-F-191/2	(Rev D) Fencing, Wire and Post, Metal (Chain-Link Fence Gates)
FS RR-F-191/3	(Rev D) Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)
FS RR-F-191/4	(Rev D) Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

Military Specifications (MS):

MS MIL-B-52489	(Rev E) Barbed Tape, Concertina

4.0 MATERIALS

Subcontractor to use only new materials of the type specified. No used or salvaged materials shall be allowed.

4.1 Chain Link Fence

4.1.1 Fabric

The fabric shall be FS RR-F-191/1, Type I, zinc-coated steel wire with minimum coating weight of 2.0 ounces of zinc per square foot of coated surface, or Type II, aluminum-coated steel wire. Fabric shall be fabricated of 9-gauge wire woven in 2-inch mesh. Fabric height shall be 7 feet. Fabric shall be twisted and barbed on the top salvage and knuckled on the bottom salvage.

4.1.2 Gates

The gates shall be as per FS RR-F-191/2. Gate shall be of the sliding type. Gate frames shall be constructed of Class 1 Grade A or B, steel pipe, size SP2, as specified in FS RR-F-191/3. Gate fabric shall be as specified for chain link fabric. Gate leaves more than 8 feet wide shall have either intermediate members and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist. Gate leaves less than 8 feet wide shall have truss rods or intermediate braces. Intermediate braces shall be provided on all gate frames. Gate fabric shall be attached to the gate frame by method standard with the manufacturer except that welding will not be permitted. Latches, hinges, stops, keepers, rollers, and other hardware items shall be furnished as required for the operation of the gate. Latches shall be arranged for padlocking so that the padlock will be accessible from both sides of the gate. Stops shall be provided for holding the gates in the open position.

4.1.3 Padlocks

Padlocks shall be ASTM F 883, Type PO1, Grace 2, Size 1¾ inch. Padlocks shall be keyed alike and each lock shall be furnished with two keys.

4.1.4 Posts

The posts shall be FS RR-F-191/3, zinc-coated; Class 1 Grade A or B, steel pipe; Class 3, formed steel sections; or Class 6, steel square sections. Class 4, steel H-section may be used for line posts in lieu of line post shapes specified for other classes. Line posts and terminal (corner, gate, and pull) posts selected shall be of the same class throughout the fence. Gate post shall be either round or square, subject to the limitation specified in FS RR-F-191/3.

4.1.5 Braces

Braces shall be FS RR-F-191/3, zinc-coated, Class 1, Grade A or B, steel pipe, size SP1. Class 3, formed steel sections, size FS1, conforming to FS RR-F-191/3, may be used as braces if Class 3 line posts are furnished.

4.1.6 Accessories

Accessories shall be as per FS RR-F-191/4. Ferrous accessories shall be zinc or aluminum coated. Truss rods shall be furnished for each terminal post. Truss rods shall be provided with turnbuckles or other equivalent provisions for adjustment. Tie wire for attaching fabric to rails, braces, and posts shall be 9-gauge steel wire

4.2 Concrete

Concrete shall be ASTM C 94, using ¾-inch maximum size aggregate, and having minimum compressive strength of 3,000 psi at 28 days. Grout shall consist of one part portland cement to three parts clean, well-graded sand and the minimum amount of water to produce a workable mix.

5.0 INSTALLATION

Fence shall be installed to the lines and grades indicated by the Site Manager in the field. The area on either side of the fence line will be cleared by others as necessary. Line posts shall be spaced equidistant at intervals not exceeding 10 feet. Terminal (corner, gate, and pull) posts shall be set at abrupt changes in vertical and horizontal alignment. Fabric shall be continuous between terminal posts; however, runs between terminal posts shall not exceed 500 feet. Damage to the galvanized surface due to welding shall be repaired with "repair sticks" of zinc-cadmium alloys or zinc-tin-lead alloys per AWS WZC.

5.1 Posts

Posts shall be set plumb and in alignment. Except where solid rock is encountered, posts shall be driven to the depth of 18 inches. Where solid rock is encountered with no overburden, posts shall be set to a minimum depth of 18 inches in rock. Where solid rock is covered with an overburden of soil or loose rock, posts shall be set to the minimum depth of 18 inches unless a penetration of 18 inches in solid rock is achieved before reaching the indicated depth, in which case depth of penetration shall terminate.

All portions of posts set in rock shall be grouted Portions of posts not set in rock shall be set in concrete from the rock to ground level. Posts set in concrete shall be set in holes not less than 18 inches deep. Diameters of holes in solid rock shall be at least 1 inch greater than the largest cross section of the post Concrete and grout shall be thoroughly consolidated around each post, shall be free of voids, and finished to form a dome. Concrete and grout shall be allowed to cure for 72 hours prior to attachment of any item to the posts. Class 3 type line posts may be mechanically driven if the driven posts develop strengths at least equal to posts set in concrete and if rock is not encountered. Driven posts shall be set to a minimum depth of 3 feet and shall be protected with drive caps when being set. Fence post rigidity shall be tested by applying a 50-pound force on the post, perpendicular to the fabric, at 5 feet above ground. Post movement measured at the point where the force is applied shall be less than or equal to ¾ inch from the relaxed position. Every tenth post shall be tested for rigidity. When a post fails this test, further tests on the next four posts on either side of the failed post shall be made. All failed posts shall be removed, replaced, and retested at the Subcontractor's expense.

5.2 Rails

5.2.1 Top Rails

Top rail shall be supported at each post to form a continuous brace between terminal posts. Where required, sections of top rail shall be joined using sleeves or couplings that will allow expansion or contraction of the rail.

5.2.2 Supporting Arms

Design supporting arms to accommodate top rail. Install supporting arms as recommended by manufacturer. In addition to manufacturer's standard connections, permanently secure supporting arms to posts. Studs driven by low-velocity power-actuated tools may be used with steel, wrought iron, ductile iron, or malleable iron. Do not use studs driven by power-actuated tools with gray iron or other material that will fracture.

5.2.3 Chain Link Fabric

Chain link fabric shall be installed in the side of the post indicated. Fabric shall be attached to terminal posts with stretcher bars and tension bands. Bands shall be spaced at approximately 15-inch intervals. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height. Fabric shall be fastened to line posts at approximately 15-inch intervals and fastened to all rails and tension wires at approximately 24-inch intervals. Fabric shall be cut by untwisting and removing pickets. Splicing shall be accomplished by weaving a single picket into the ends of the rolls to be joined. The bottom of the installed fabric shall be 2 inches (plus or minus ½ inch) above the ground.

5.2.4 Gates

Gates shall be installed at the locations shown. Latches, stops, and keepers shall be installed as required. Slide gates shall be installed as recommended by the manufacturer. Padlocks shall be attached to gates or gate posts with chains and hinge pins, and hardware shall be welded or otherwise secured to prevent removal.

5.2.5 Barbed Wire

Three parallel strands of reinforced barbed wire shall be installed. Barbed wire shall be stretched out to its full length, set on top of the supporting arms, and then secured. The barbed wire shall be secured at one point every 10-foot interval.

6.0 REPAIRS

Repairs to be made to existing fence as needed. Location of areas needing repair will be located by the Site Manager. Foster Wheeler Environmental will be responsible for the clearing of brush at any area needing repair. The Subcontractor will patch the area needing repair by weaving new chain link fence to the existing chain link fence at the damaged areas, preventing unauthorized access to the Site. Damaged areas at fence post locations may need additional clamps to secure chain link fence to existing posts.

7.0 HEALTH AND SAFETY

All site activities shall be subject to the requirements of the Site Health and Safety Plan (SHSP) which will be provided to the Subcontractor upon contract award. Subcontractor personnel must meet the applicable requirements of this plan and follow the directions of the Site Health and Safety Officer (SHSO) to protect personnel and/or the environment.

Prior to initiating field activities, the Subcontractor shall review the SHSP and certify, in writing, an understanding and intent to comply with all applicable requirements. Foster Wheeler Environmental will provide management and oversight over all Health and Safety activities. Foster Wheeler Environmental will have the authority to audit and terminate the Subcontractor's field operations if such audit determines that the operations violate the SHSP, OSHA regulations, or Site work practices.

The construction of the fence described in this SOW will occur in a non-hazardous waste environment using typical construction health and safety work practices.

The Subcontractor will be required to comply with all applicable OSHA 1910 and 1926 regulations in addition to the requirements of the SHSP. All Subcontractor employees will be required to attend Site-Specific Safety and Health Training (approximately one hour) prior to initially starting work on the Site. In addition, the Subcontractor's personnel will be required to attend daily safety briefings, for approximately twenty (20) minutes at the start of each day, to be conducted by Foster Wheeler Environmental. Subcontractors may be requested by Foster Wheeler Environmental to present a safety briefing based upon their scope of work.

8.0 RESPONSIBILITIES OF THE SUBCONTRACTOR

8.1 Subcontract Services

The work shall include, but not be limited to, providing supervision, labor, materials, equipment, services, and support facilities necessary to complete the tasks described in Section 2.0. The Subcontractor will be required to coordinate the work described herein with construction efforts that will be performed by others concurrently at the Site.

8.2 Submittals

Subcontractor must submit all the submittals as defined. The Subcontractor must obtain approval for any item prior to its inclusion in the work specified at the Site.

8.3 Permits

Subcontractor shall apply for and obtain all required permits and pay all necessary fees relating to the work described in this SOW with the exception of working in or near wetlands. Permits for work in or near wetlands at the Site will be the responsibility of Foster Wheeler Environmental. Subcontractor shall comply with requirements set forth in the Wetlands Permit.

8.4 Security

The Subcontractor shall be responsible for providing security for all Subcontractor-owned equipment and materials at the Site. Vandalism or loss of equipment shall not be justification for stopping or delaying work.

8.5 Utilities and Traffic Control

The Subcontractor shall furnish all services necessary for the performance of the work described in this SOW. Traffic control, if required, shall be the responsibility of the Subcontractor and shall conform with federal, state, and local requirements.

8.6 Quality Control

The Subcontractor shall perform high quality work in accordance with this SOW and all permits or applications required. All field activities shall be conducted in an efficient and professional manner with minimal damage to the environment. All deficiencies in materials, activities, or workmanship shall be corrected by the Subcontractor at no additional cost to Foster Wheeler Environmental or the Navy.

A Quality Control Plan (QCP) has been prepared by Foster Wheeler Environmental for this project. The Subcontractor will be required to attend a quality control coordination meeting. The Subcontractor will also be required to make available all aspects of the work for inspection by Foster Wheeler Environmental quality control staff for conformance with the quality control aspects of the plan. Any unauthorized deviations from the specifications will be reported to the Subcontractor in writing, for correction at the Subcontractor's expense.

During the performance or at the completion of work, as appropriate, the following will be required from the Subcontractor:

- A Certificate of Compliance stating: "All work provided under the Subcontract complies with all requirements of the drawings and specifications including Foster Wheeler Environmental and the Navy."
- Documents identifying any deviations and their acceptance.

8.7 Project Meetings

The Subcontractor will be required to attend the following meetings at the outset of the project and during the performance of the work:

- A quality control coordination meeting with the Navy and Foster Wheeler Environmental.
- Daily safety briefings with Foster Wheeler Environmental when working on-site.

8.8 Working Hours

Normal working hours for the Site shall be Monday through Friday, 7:00 a.m. to 5:30 p.m.

9.0 RESPONSIBILITIES OF FOSTER WHEELER ENVIRONMENTAL

9.1 Site Access

Access to the Site shall be arranged by Foster Wheeler Environmental through the Navy prior to the commencement of the work. Subcontractor personnel shall not enter onto any portion of the Site without first obtaining approval from Foster Wheeler Environmental. Subcontractor equipment shall meet OSHA or industry safety standards, and access to the Site is permitted only with Foster Wheeler Environmental's approval.

9.2 Project Plans

Upon contract award, Foster Wheeler Environmental will provide the Subcontractor with the following project plans:

- SHSP
- QCP
- Identification of areas needing repair
- Clearing as necessary
- Provide location of proposed fence and provide clearing

9.3 Site Manager

A Site Manager, responsible for all site activities, will be assigned to the project and will act as the interface point for correspondence between the Subcontractor and Foster Wheeler Environmental. A Foster Wheeler Environmental Site Engineer will assist in the coordination of the Subcontractor's activities and the work of others being performed concurrently.

9.4 Staging and Storage Areas

The Subcontractor will be provided with an area for use as working and staging areas. The Site Manager will designate this area prior to Subcontractor mobilization. No storage of equipment or stockpiling of material will be permitted within the Navy-owned right-of-way. Excessive stockpiling of material will not be allowed.

9.5 Review of Shop Drawings

Foster Wheeler Environmental will provide the shop drawings submitted by the Subcontractor to the Navy for review and comment. The Subcontractor will be required to resolve comments with Foster Wheeler Environmental and the Navy and incorporate the resolutions into subsequent submittals for final acceptance.

9.6 Quality Control

As described in Section 7.6, Foster Wheeler Environmental will be responsible for the coordination of quality control activities at the Site.

9.7 Temporary Facilities

Portable toilet facilities will be provided.

10.0 WORK SCHEDULE

The work schedule for this project is aggressive and the milestones described herein must be met.

	Description	Milestone
1.	Submit all drawings and material information sheets	Within one (1) week of award
2.	Foster Wheeler Environmental to review and provide comments	Within one (1) week of receipt
3.	Subcontractor to update and submit	Within three (3) working days of receipt of comments
4.	Navy to review revised submittal	Within one (1) week of receipt
5.	Mobilize to Site	Within three (3) working days of NTP

11.0 MEASUREMENT AND PAYMENT

The work shall be measured and paid in accordance with the payment tasks included herein and the submitted breakdown provided in the Price Quotation Form. The following payment tasks have been identified:

1. Submittals
   Payment to be made upon acceptance of all submittals as described in SOW Section 2.1.

2. Mobilization/Demobilization
   Payment to be made upon successful mobilization and demobilization.

3. Installation of New Fencing
   Payment to be made upon successful installation of new fencing inclusive of all accessories and appurtenances. Field measurement shall be based upon mutual agreement between Foster Wheeler Environmental and Subcontractor.

4. Repair of Existing Fencing

   Payment to be made upon successful installation of new fencing inclusive of all accessories and appurtenances. Field measurement shall be based upon mutual agreement between Foster Wheeler Environmental and Subcontractor

5. Gate Installation

   Payment to be made upon successful installation of new 20-foot sliding gate inclusive of all accessories and appurtenances.

6. Final Payment

   Final payment to be made upon receipt of final documentation and resolution of all punchlist items.

All of the above payment task milestones are subject to acceptance/approval by Foster Wheeler Environmental and the Navy of the payment item indicated.

ATTACHMENT B

Price Quotation Form

The erection of the chain link fencing will be paid in accordance with the following payment schedule. The Subcontractor is to provide lump sum costs for each task.

	Payment Task Description	Unit Cost	Unit	Proposed Cost
1.	Submittals	$_____	LS	$_____
2.	Mobilization	$_____ ea	1	$_____
3.	Cost to deliver and install 20-foot sliding gate fence with accessories.	$_____ ea	1	$_____
4.	Cost for new fence, including delivery of material and installation of fence and accessories.	$_____	Linear Feet * 2,100 LF	$_____
5.	Cost for repairing of existing fence as needed. Including delivery of material and installation of fence and accessories.	$_____	Linear Feet * 225 LF	$_____
6.	Demobilization	$_____ ea	1	$_____
7.	Final Payment - 10% of Total Contract	$_____		$_____
			TOTAL COST:	$_____